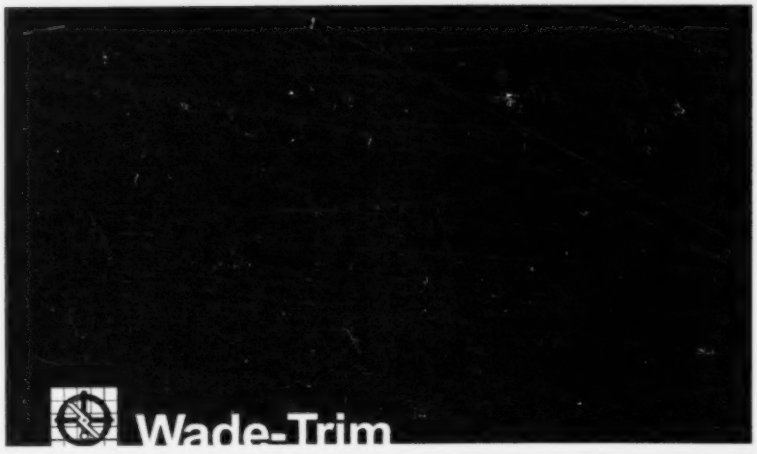
Review and Analysis of

Posted Speed Limits and Speed Limit Setting Practices in British Columbia

Final Report
Spring 2003

British Columbia Ministry of Transportation
4B - 940 Blanshard Street
Victoria, B.C. V8W 9T5



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Prepared for

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4B - 940 Blanshard Street
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EXECUTIVE SUMMARY

Introduction

This report contains a review and assessment of speed limits posted in speed zones on Provincial rural highways, and practices used by the Ministry of Transportation (MoT) to determine the appropriate speed limit. Municipal speed limits and speed limit setting practices are not within the scope of this study. Based on the results of the assessment, recommendations are offered to improve safety and traffic operations on Provincial roads through the application of speed limits and other speed management techniques.

Speed zoning has been used for many years in British Columbia to influence motorist behavior. In general, speed zoning is the process of establishing a safe and reasonable speed limit on a highway segment. Speed limits are primarily set for safety reasons, i.e., to reach a balance between travel time and crash risk, and to provide a basis for enforcement of inappropriate speeding behavior. Maximum speed limits enhance safety by placing an upper limit on speed choice, and reduce the differences in vehicle speeds by drivers using the same road at the same time.

Based on years of experience and observation, the following fundamental concepts have been used to establish realistic speed zones.

> The majority of motorists drive at a speed they consider reasonable, and safe for road, traffic, and environmental conditions. Posted limits which are set higher or lower than dictated by roadway and traffic conditions are ignored by the majority of motorists.
>
> The normally careful and competent actions of a reasonable person should be considered legal.
>
> A speed limit should be set so that the majority of motorists observe it voluntarily and enforcement can be directed to the minority of offenders.
>
> A driver's choice of speed can impose risks on other road users. Crash severity increases with increasing speeds because in a collision, the amount of kinetic energy dissipated is proportional to the square of the velocity. Crashes, however, appear to depend less on speed and more on the variation in speeds. The likelihood of a crash occurring is significantly greater for motorists traveling at speed slower and faster than the mean speed of traffic.
>
> Maximum speed limits are set for ideal road, traffic, and environmental conditions.

Establishing safe and realistic uniform speed zones is important because it invites public compliance by conforming to the behavior of the majority of motorists and provides a clear reminder to violators. It also assists the courts by providing a guide as to what constitutes a reasonable and prudent speed and reduces arbitrary enforcement and conviction tolerances. Furthermore, it ensures that the requirements and intent of Provincial and local laws and ordinances are met.

Objectives

The primary objectives of the project were to examine speed limit setting procedures, and to collect and analyze road, traffic, and safety information to address the following questions.

1. Are Ministry speed limits appropriate and consistent?
2. Are there areas where the speed limit should be changed (raised or lowered)?
3. Are there areas where the speed limit could be eliminated?

Scope

At the request of the British Columbia Ministry of Transportation (MoT), a comprehensive review of speed zones on approximately 11,000 kilometers of Provincial roads was conducted during the fall of 2002. A review was also made of the practices employed by the Ministry to set speed limits.

The scope of the study included the following activities.

Interviews with Ministry officials and contract personnel to obtain information on speed limit setting practices, problems, and issues.

Obtained background information from the Ministry including road segments that are currently speed zoned, traffic volume information, geometric and land use data from the Ministry of Transportation Online photolog and other Ministry sources, laser speed data collected by the Ministry on selected segments and data obtained at the Insurance Corporation of British Columbia permanent sites, crash data available from the MoT Highway Accident System, and Ministry publications and reports related to speed zoning.

A field review of approximately 5,000 kilometers of Provincial roads throughout British Columbia by the authors to examine and assess the consistency and application of speed limits in speed zones.

An analysis of road classification, geometric, land use, volume, speed, and crash data on approximately 11,000 kilometers of Provincial highways with posted speed limits.

A before and after with control group analysis of crashes on segments where speed limits were raised from 90 to 100 km/h during the years 1997 and 1998. Before and after speed data at several of the sites were also examined.

The scope of the study was limited to an engineering review of speed limits and did not include consultation with enforcement agencies such as the Royal Canadian Mounted Police (RCMP). The scope of the study did not include an assessment of temporary or part-time speed limits such as work zone limits or school zone limits. The scope also did not include a review or assessment of public information or other programs aimed at educating motorists, or the use and effects of police enforcement of speed limits.

Findings

Speed Limit Setting Practices

The *Motor Vehicle Act* provides statutory maximum speed limits of 50 km/h within municipalities, and 80 km/h outside of municipalities. The *Act* permits the Ministry to adjust the speed limit within speed zones by erecting a sign. The Chief Engineer of the Ministry of Transportation approves posted speed limits in speed zones on all Provincial highways. The Ministry uses Technical Circular T-10/00, which includes the Institute of Engineers (ITE) document entitled ***Speed Zone Guidelines – A Proposed Recommended Practice,*** to assess speed limits. The practice considers the 85th percentile speed (the speed at or below which 85 percent of the motorists are traveling), road geometry, roadside development, and crash history. The Provincial posted speed limit is subject to a 50 km/h minimum and 110 km/h maximum limit. The speed limit procedure also contains guidelines for setting speed limits in transition zones.

The ITE document is the latest guideline available for setting speed limits. Data collection and analysis practices by Ministry personnel appear to be excellent although reductions in personnel in recent years have imposed difficulties in collecting and maintaining the data base needed for existing and future speed limit assessments. There is a need to conduct speed limit studies on an ongoing basis to keep speed limits current with changes in land use and roadside development, and with improvements in the design of Provincial highways. In addition, personnel should be available to make a local review of conditions to confirm the appropriateness of speed limit changes recommended in this report.

Issues with the current Ministry practices include the 110 km/h maximum limit, and the transition zone guidelines. Consideration should be given to establishing a new maximum speed limit and limits in mountainous terrain, providing advisory night speed limits, and modifying the procedure for setting transition zones and advisory limits on horizontal curves. Other legislative actions include enacting a basic speed law to place the responsibility for speed decisions on the driver, and the use of four-way flashers on vehicles traveling at slow speeds. These items are discussed in the following section of this summary.

Review and Analysis of Current Posted Maximum Speed Limits

The review of the MoT geometric, traffic, speed, and crash data and the field review of 5,000 km of Provincial highways provided a number of findings that should be considered to improve speed limits and their effectiveness. These findings are discussed in the following sections.

Appropriateness and Consistency of Posted Speed Limits

A speed limit is reasonable and appropriate for conditions when the majority of drivers perceive the limit is reasonable by selecting their speed at or below the posted limit, and when the frequency of crashes due to inappropriate speed is low. Ideally, an appropriate speed limit is determined based on the quantitative factors established in conformance with the MoT speed limit setting practice. Generally, the posted limit should be set near the 85th percentile speed considering the functional class and geometric design of the road, roadside development and access management in the area, and the crash history. Based on an analysis of the available data and a review of the road system, speed limits on rural divided highways with full access control appear to be set too low, some speed limits in adverse mountainous sections appear to be set too high, and some limits posted in other areas appear to be set too low for conditions. These issues are discussed in the following sections.

Speed limits are consistent when highway segments with similar geometrics, roadside development, traffic, and safety characteristics have the same posted speed limit. Accordingly, for similar conditions, the same posted speed limit should exist from region to region or road type to road type. While the majority of the rural two-lane highway system is posted at 90 or 100 km/h, there are notable inconsistencies with some segments, even within the same region. These segments have been identified and it is recommended that they be reviewed by MoT and revised where appropriate. Changes in the limits on segments that include municipalities should be made with consultation with the appropriate authorities.

Should Speed Limits be Changed

Maximum speed limits posted on fixed-message signs are based on ideal traffic, environmental, and road conditions. The maximum limit should seem high to the majority of drivers, or it is not a maximum limit. When less than ideal conditions exist, the driver must adjust their vehicle speed that is appropriate for conditions. One of the most important objectives in posting a speed limit is to inform the driver of a reasonable and prudent speed for the *best* conditions. Based on a comprehensive review of geometric, land use, traffic, speed, and crash data on road segments with posted speed limits, and on-site observations, the following findings are offered.

The maximum speed limit in British Columbia is 110 km/h, which includes rural multilane divided facilities with full control of access. Operating 85th percentile speeds on these roads range between 116 and 126 km/h. The crash rates are below the critical rate. In other countries with mountainous terrain such as Austria, Finland, France, Italy, etc. maximum speed limits range from 120 to 140 km/h. In western States in the US, the maximum limit is generally 120 km/h on these facilities. The Ministry should consider establishing a new maximum limit of 120 km/h for rural multilane divided roads with full access control.

The posted speed limits on the majority of the Provincial two-lane segments are 90 and 100 km/h. Based on numerous speed limit studies conducted in the US, 85th percentile speeds on two-lane tangent segments range from 93 to 104 km/h. Actual 85th percentile speeds reported in British Columbia range from 92 to 111 km/h. The evidence suggests a maximum speed limit of 105 km/h for rural two-lane highways, however, as the MoT posts limits in 10 km/h increments, the maximum limit should remain at 100 km/h. Suggestions are offered to raise some limits on existing 90 km/h segments.

There are a number of road segments that cross the mountain ranges. Characteristics of these two-lane segments include grades exceeding 3.5 percent, horizontal curves with 30 to 60 km/h posted advisory limits, and the frequent use of passing lanes. While many segments are posted at 90 km/h, few vehicles can safely be maneuvered near that speed. Consideration should be given to determining the maximum safe speed limit for these mountainous segments. Suggested limits are included in the report.

In addition, there are a number of 80 km/h speed limits posted on Vancouver Island and in speed zones in other sections of the Province. Sections of these zones have speed limits that are not appropriate for conditions. A review should be made, as time and personnel limitations permit, to identify these zones so the appropriate speed limit can be posted.

Elimination of Posted Speed Limits in Some Rural Low-Volume Areas

In the northern region of British Columbia, there are vast segments of rural highway that carry less than 500 vehicles per day. Most of these segments are two-lane paved roads with varying shoulder widths, and have little roadside signing and sparse roadside development. It is possible that posted speed limits have little impact because they do not provide useful information that the driver need to negotiate the rural area, especially during night time and inclement weather conditions. Consideration should be given to eliminating the posted speed limits on these sections, however, there are arguments that drivers will increase speeds and crashes may increase. Before implementation, it is also important that the basic speed rule be enacted as discussed below.

Other Speed Related Findings

Speed Limits at Signalized Intersections on Rural Freeways

In order to construct as many kilometers of freeway as possible with limited resources, some rural freeways contain at-grade intersections with traffic signals. Because motorists typically do not anticipate that they may have to stop on a freeway, the Ministry utilizes an active stop-for-signal ahead warning system and a general speed limit of 90 km/h or less depending upon conditions. The warning system with reduced speed zone appears to be effective in obtaining the desired response from motorists. It is important that the reduced speed zones are set on the basis of an engineering study, and the advance warning system be appropriately timed for existing operating and roadway design conditions. However, the maximum speed limit for these special conditions on rural freeways should be retained at 90 km/h.

Transition Zones

Based on the author's field review of numerous transition zones, and the limited speed data available for existing zones, it appears that motorists do not slow down in the transition zone because the limit is not based on road geometry and roadside development. Accordingly, the effectiveness of such zones is questionable. Consideration should be given to eliminating the transition zones where they are not supported by associated changes in road geometry, access points, etc. In other words, the speed limit should be based on conditions that are visible to the driver. The use of speed limit change ahead signs by MoT when speed limits are lowered for road geometry, roadside development, parking, pedestrian activity, etc. is a desirable and necessary practice.

Advisory Speed Limits at Night

According to the crash data provided in the Wildlife Accident Reporting System, 4,768 wildlife related crashes occurring in the Province during the year 2000. This represents a significant crash problem to humans and the native animals. While a number of mitigation efforts are useful, it was observed that advisory night speed limits are posted on some Provincial roads. It is suggested that consideration should be given to posting additional advisory night speed limits on other rural segments where wildlife crashes have been reported on a reoccurring basis. Based on the animal incidents and the need for drivers to take appropriate action of avoid a crash, it is suggested that these advisory limits should generally be 20 km/h below the maximum posted limit.

Basic Speed Law

A review of the *Motor Vehicle Act* suggests that motorists must not exceed the statutory or posted speed limits in the Province. Excessive speeding is defined as driving at a speed greater than 40 km/h over the applicable limit. While similar laws exist in the U.S. and other countries, most countries also have a basic speed rule which requires a motorist to drive at a speed that is reasonable and prudent for existing conditions. The purpose of the basic speed rule is to place the responsibility of speed choice on the driver who can assess existing conditions and take appropriate action.

Enactment of a basic speed rule is suggested for British Columbia. Currently a motorist may be operating below a fixed maximum limit set by the Province, but exceed the reasonable speed for conditions. Appropriate adjudications for violations of the basic speed law should also be established.

Warning Flashers on Slow Moving Vehicles

The Ministry currently uses a grade advisory system to encourage management of heavy vehicle speeds in mountainous areas. Escape ramps or turnouts are provided where possible for runaway vehicles. These are excellent examples of speed management in difficult terrains.

On some downgrades, the Ministry advises trucks to use emergency four-way flashers to warn motorists of their slow speed. However, trucks, busses, recreational vehicles, and other motorists often travel much slower than other vehicles on upgrades. In the US and other countries, motorists in mountainous areas who travel less than 50 or 60 km/h, either upgrade or downgrade, are required to turn on their emergency flashers. Enactment of similar legislation is suggested for British Columbia.

Other Speed Related Mitigation Efforts

Traveling throughout the Province provided an insight into many other design and traffic control efforts the MoT has taken to mitigate and/or accommodate vehicle speeds. These are items the MoT is doing that are equal to or better than agencies in many other countries. Some of the more pertain features are listed below.

As previously mentioned, at every traffic signal on a high-speed (70 km/h and above) road that was examined, the MoT had installed an active warning system that advised motorists about the operation of the signal, including providing sufficient time to slow down and stop during the amber phase. This is an important safety feature that is especially effective when freeway and expressway type road segments have at-grade crossings.

There is considerable use of right-and left-turn lanes for at-grade intersections. These speed change lanes provide safety enhancements by removing the slow speed turning vehicles from the high-speed through vehicles thereby reducing speed variance.

Clearly defined access management techniques have been used in small towns, cites, and other locations with roadside development along the Provincial highway system. Some communities have made significant progress with the installation of access

management features, while other communities have made little visible progress. One primary technique employed is to reduce the number of commercial driveways and define the location of the primary driveway through the use of concrete barriers. Limiting the number and location of driveways also improves traffic flow and reduces collisions due to slowing and turning traffic.

INTRODUCTION

This report contains a review and assessment of speed limits posted in speed zones on Provincial rural highways, and practices used by the Ministry of Transportation (MoT) to determine and set the appropriate speed limit. This report does not address speed limits or speed limit setting practices in municipalities. Based on the assessment, recommendations are offered to improve safety and traffic operations on Provincial roads through the use of speed limits and other speed management techniques.

Speed zoning has been used for many years in British Columbia to influence motorist behavior. In general, speed zoning is the process of establishing a safe and reasonable speed limit on a highway segment. Speed limits are set for safety reasons, i.e., to reach a balance between travel time and crash risk, and to provide a basis for enforcement of inappropriate speeding behavior of motorists. As summarized in a recent study, speed limits are set for the following safety reasons.[1]

The significant risk drivers can impose on other road users.
The inability of some drivers to correctly judge the capabilities of their vehicles.
Some drivers underestimate the effects of speed on crash probability and severity.

Maximum speed limits enhance the safety objective by placing an upper limit on speed choice, and to reduce the differences in vehicle speeds by drivers using the same road at the same time.[1]

Based on years of experience and observation, the following fundamental concepts have been used to establish realistic speed zones.[2]

The majority of motorists drive at a speed they consider reasonable, and safe for road, traffic, and environmental conditions. Posted limits which are set higher or lower than dictated by roadway and traffic conditions are ignored by the majority of motorists.

The normally careful and competent actions of a reasonable person should be considered legal.

A speed limit should be set so that the majority of motorists observe it voluntarily and enforcement can be directed to the minority of offenders.

A speed limit should seem too fast for a majority of users or it is not a maximum limit.

A driver's choice of speed can impose risks on other road users. Crash severity increases with increasing speeds because in a collision, the amount of kinetic energy dissipated is proportional to the square of the velocity. Crashes, however, appear to depend less on speed and more on the variation in speeds. The likelihood of a crash occurring is significantly greater for motorists traveling at speed slower and faster than the mean speed of traffic.

As shown in Figure 1, maximum speed limits should be set for ideal road, traffic, and environmental conditions. Drivers should adjust their speed for conditions that are less than ideal, as shown in Figure 2.

Establishing safe and realistic uniform speed zones is important because it invites public compliance by conforming to the behavior of the majority of motorists and provides a clear reminder to violators. It also assists the courts by providing a guide as to what constitutes a reasonable and prudent speed and reduces arbitrary enforcement and conviction tolerances. Furthermore, it ensures that the requirements and intent of Provincial and local laws and ordinances are met.

Figure 1. Maximum speed limits are set for ideal conditions.

Figure 2. Drivers should adjust their speed for conditions less than ideal.

OBJECTIVES AND SCOPE

The primary objectives of the project were to examine speed limit setting procedures and to collect and analyze road, traffic, and safety information to address the following questions.

1. Are Ministry speed limits appropriate and consistent?

2. Are there areas where the speed limit should be changed (raised or lowered)?

3. Are there areas where the speed limit could be eliminated?

The scope of the study included interviews with Ministry officials, a field review of approximately 5,000 km of rural numbered Provincial highways, an analysis of engineering and safety data for speed zones on 11,000 km, and a before and after analysis of speed and crash information on roads were speed limits were raised from 90 km/h to 100 km/h.

The scope of the study was limited to an engineering review of speed limits and did not include consultation with enforcement agencies such as the Royal Canadian Mounted Police (RCMP). The investigation did not include a review or assessment of urban speed limits or temporary or part-time speed limits such as limits used in work zones or school zones. The study scope also did not include an assessment of public information materials or programs aimed at educating motorists, or the use and effects of police enforcement of speed limits.

STUDY PROCEDURES

At the request of the British Columbia Ministry of Transportation (MoT), a comprehensive review of speed zones on approximately 11,000 kilometers of rural Provincial roads was conducted during the period from October 2002 to March 2003. A review was also made of the procedures and practices employed by the Ministry to set speed limits.

The study procedures consisted of the following activities.

During the week of October 20-26, 2002, interviews were conducted with Ministry officials at the central MoT office in Victoria and at the Region offices in Kamloops and Prince George. The purpose of the interviews was to obtain information on speed limit setting practices, problems, issues, and related speed zoning information.

Also during October 20-26, 2002, a field review of approximately 5,000 kilometers of Provincial roads throughout British Columbia was conducted by the authors to examine and assess the consistency and application of speed limits in speed zones.

Following the field visits, background information was obtained from the Ministry. These data included a list of road segments that are currently speed zoned, traffic volume information, geometric and land use data from the MoT Online photolog and other Ministry sources, laser speed data collected by the Ministry on selected segments and speed data obtained at the Insurance Corporation of British Columbia permanent sites. Crash data for the 5-year period, 1997 through 2001, were obtained from the MoT Highway Accident System for each study segment. Ministry publications and reports related to speed zoning were also obtained and used in the assessment.

An analysis of road classification, geometric, land use, volume, speed, and crash data was conducted for 1,129 speed zones consisting of approximately 11,000 kilometers of Provincial highways with posted speed limits.

A before and after with control group analysis of crashes on segments where speed limits were raised from 90 to 100 km/h during the years 1997 and 1998. Before and after speed data at several of the sites were also examined.

ASSESSMENT

The first part of the assessment included a review of the British Columbia statutes and regulations governing speed limits, and a review of speed limit setting practices used by the MoT the establish speed limits in speed zones. The final phase of the assessment consisted of an analysis of speed limits posted on approximately 11,000 kilometers of Provincial roads. The results of the analyses are presented in the following sections of this report.

Speed Limit Legislation in British Columbia

As described in Section 146 of the *Motor Vehicle Act,* statutory maximum speed limits in British Columbia are 50 km/h within municipalities, and 80 km/h outside of municipalities. The *Act* permits the Ministry to increase or decrease the speed limit within speed zones by erecting a sign. The *Act* also prohibits careless driving, defines slow driving and excessive speeding, and provides fines for speeding offences. A copy of the speed-related sections of the *Act* is provided in Appendix A.

MoT Speed Limit Setting Practices

The Chief Engineer of the Ministry of Transportation approves posted speed limits in speed zones on all Provincial highways. The Ministry uses Technical Circular T-10/00, which includes the Institute of Engineers (ITE) document entitled *Speed Zone Guidelines – A Proposed Recommended Practice,* to assess speed limits. A copy of the procedure is provided in Appendix B.

The speed limit setting practice considers the 85th percentile speed (the speed at or below which 85 percent of the motorists are traveling), road geometry including alignment, sight distance, road and shoulder characteristics, roadside development, pedestrian and bicycle activity, and crash history. The MoT speed limit procedure also contains guidelines for setting speed limits in transition zones from rural high-speed conditions to urban or areas with an increase in roadside development and access points.

The ITE document is the latest guideline available for setting speed limits, and complies with the basic principles outlined in Transportation Research Board Special Report 254.[1] Based on a review of existing documentation and interviews with MoT personnel, data collection and analysis practices by Ministry personnel appear to be appropriate. Speed samples are taken by lidar (often referred to as lazer), typically during a two-hour non-peak period on weekdays at representative locations in the study segment. The instruments are calibrated and handled with reasonable care. After the data are collected, the factors are subjectively evaluated. The 85th

percentile speed is given primary consideration in the evaluation process. Based on a 1997 study of Canadian speed limit experiences and practices, the MoT procedures are consistent with general practices found in other Provinces.[3]

Reductions in personnel in recent years have imposed difficulties in collecting and maintaining the data base needed for existing and future speed limit assessments. There is a continuing need to conduct speed limit studies on an ongoing basis to keep posted speed limits current with changes in land use and roadside development, and with improvements in the design of Provincial highways. In addition, trained personnel should be available to make a local review of conditions and implement the speed limit changes recommended in this report.

Provincial posted speed limits typically range from 30 km/h to 110 km/h. The limits are posted in 10 km/h increments. Based on the field review and an analysis of 11,000 kilometers of Provincial speed zones, speed limits are generally posted by road classification as shown in Table 1. The speed limits are also comparable with speed limits posted on comparable roads in other Canadian Provinces.[3] The survey also revealed that some Canadian respondents felt that 120 km/h was an appropriate maximum limit for freeways.

It is important to note, however, that there is a difference in maximum posted speed limits between British Columbia and other countries with similar terrain and environmental conditions. Shown in Table 2 is a summary of posted speed limits by road class for 24 other countries. The maximum speed limit on rural freeways ranges from a low of 70 km/h for a small car in Rumania to 140 km/h for a large car in Italy. Speed limits greater than the current maximum limit of 110 km/h in British Columbia are found in 13 of the 24 countries. The most frequently occurring upper speed limit is 120 km/h.

Based on the assessment, issues with the current Ministry practices include the 110 km/h maximum limit, and the transition zone guidelines. Consideration should be given to establishing a new maximum speed limit for freeways and other limited access highways. Also, new general limits should be established for roads in adverse mountainous terrain. Consideration should also be given to providing advisory night speed limits in selected areas with frequent wildlife incidents. These items are discussed in a subsequent section of this report.

Table 1. Posted speed limits in British Columbia.

Road Classification	Posted Speed Limit, km/h
Rural Freeway – Full access control	110
Rural Freeway – Some at-grade intersections	100
Rural Multilane Undivided and Two-Lane with high-speed design characteristics	100
Rural Multilane Undivided and Two-Lane with lower-speed design characteristics	90
Rural to built up area transition zones	70-90
Built up areas	30-80

Table 2. Summary of maximum speed limits in other countries.

Country		Built-up Areas	Two-Lane Rural	Motorways	Multi-lane Divided**
Australia		50-60	100	110	100-110
Austria		50	100	130	100
Belgium		50-60	90	120	90-120
Czech Republic		60	90	110	
Denmark		50	80	110-100	90
Finland		50	80	120	100
France		50-60	90	130	110
	Wet weather		80	110	
Germany		50	100	130*	
Great Britain		48	96	112	112
Greece		50	80	120-100	100
Hungary		60	80	100	
Ireland		48	88		96
Italy	Engine size				
	up to 599 cm^3	50	80	90	
	600-900 cm^3	50	90	100	
	901-1300 cm^3	50	100	130	
	over 1300 cm^3	50	110	140	
Luxembourg		50-60	90	120	
Netherlands		50	80	120	100
Norway		50	80	90	
Poland		60	90	110	
Portugal		50-60	90	120	100
Rumania	Engine size				
	up to 1100 cm^3	60	70	70	
	from 1100 cm^3	60	80	80	
Sweden		50	70-90	110	90-110
Switzerland		50	70	120	
Spain		50-60	90	120	120
Turkey		50	90	90	
United States		40-60	90	120	105

* Recommended
** Multilane divided with less restricted access than motorways

Source: Based on information from a number of sources including Percy Pallet, PSL Group, and United States National Highway Traffic Safety Administration websites. Source for limits highlighted in red: *Reducing Traffic Injuries Resulting From Excess and Inappropriate Speed*, European Transport Safety Council, Brussels, January 1995

Assessment of Existing Speed Limits

The length of the Provincial road system in British Columbia is approximately 41,700 kilometers. While the majority of the system consists of Side Roads, there are approximately 11,000 kilometers of paved Primary and Secondary roads. This study primarily addresses the speed zones on these paved roads.

During the review by automobile, the relative speed of other vehicles, the road geometry, and the posted speed limit was compared to similar conditions on roads in other countries and with similar sections within the Province. After conducting the field review and analysis of the available road geometry, volume, speed, and crash information for 1,129 speed zones, the three Ministry questions were addressed. The responses to the questions are presented in the following paragraphs. In addition, during the course of this investigation, other pertinent speed-related issues were discovered. These issues are discussed in a separate section of the report entitled *Other Speed-Related Findings*.

Question 1. Are Ministry speed limits appropriate and consistent?

This question will be addressed in two parts. First, a speed limit is appropriate when it is based on the general road geometry and land use characteristics of the segment. With an appropriate limit, the majority of drivers perceive the limit is reasonable by selecting their speed at or below the posted limit. An appropriate speed limit in British Columbia can be established for any road segment by applying the quantitative factors outlined in the MoT speed limit setting procedure. Generally, the posted limit should be set near the 85th percentile speed considering the functional class and geometric design of the road, roadside development and access management in the area, and the crash history. Some general observations by the authors of speed limits on selected road segments in British Columbia are summarized in Table 3.

Based on an analysis of the available data and a field review of the road system, it is the opinion of the authors that the majority of posted speed limits in British Columbia are appropriate for conditions. There are notable exceptions as described below.

For example, as indicated in Figure 3, the available speed information on rural divided freeways with full access control indicates that the 110 km/h maximum limit is too low. Typical operating 85th percentile speeds on these roads range between 116 km/h and 126 km/h. On these segments, a new maximum limit of 120 km/h should be considered. This new maximum limit would be 10 km/h higher than is found currently in other Canadian Provinces, however, it is consistent with the 120 km/h limit used in many western states in the United States. As described in a subsequent section on the effects of speed limits, raising the speed limit has been found by some observers to increase speeds and fatal crashes. However, as concluded in *TRB Special Report 254*, it is appropriate to establish speed limits to reflect a reasonable balance between travel speeds and risk under favorable operating conditions. Consequently, while there are risks associated with high vehicle speeds, there are also considerable benefits in reducing travel time.

There are also other multilane divided freeway segments in the Province that have freeway design characteristics, but contain a limited number of intersections. The available speed data and travel characteristics on these road segments also indicate that the posted 100 km/h limit is too low. For example, a segment of Trans-Canada Highway 1 (TCH 1) between Vancouver and Hope is shown in Figure 4. This section has some right-in and right-out access points, but no at

grade intersections. The 100 km/h maximum limit on this divided highway is the same limit that is posted on many rural two-lane highways. It would be appropriate to raise the limit on these and similar divided rural highways to 110 km/h, again considering the need to strike a balance between travel speeds and associated risks.

There are also a number of 80 km/h speed zones that appear to be set too low for conditions. These segments are scattered throughout the Province. For example, on Route 1 on Vancouver Island, between Goldstream Avenue and Nanaimo there are nine 80 km/h segments. On Route 19 between Nanaimo and Campbell River there are five 80km/h segments. While there are numerous issues and factors to consider, some sections within the segments have rural characteristics, which suggest that raising the limit is appropriate for road and access point conditions. It other segments it may not be appropriate to raise the limit due to uncontrolled access points that are frequently used, and sight distance limitations.

One important consideration in raising speed limits on segments such as Route 1 or 19 is that the advance signal ahead warning flashers are set for the current 80 km/h limit. It would be necessary to move these flashers if the speed limit were raised.

Finally, there are road segments in adverse mountainous environments that appear to be set too high for conditions. There are also some long transition zones with speed limits that appear to be too low for conditions. These special conditions are discussed in the *Other Speed-Related Findings* section of this report.

Table 3. General observations of posted speed limits during the field review.

Route	Speed Limit, km/h	Termini	Comments
19	110	Parksville to Campbell River	Limit seems low on limited access sections.
99	100	Route 17 to U.S. Border	Limit seems low.
91	90	Rte. 99 to Fraser Bridge	Limit seems low.
TCH 1	100	Abbotsford to Hope	Limit seems low.
Toll 5	110	Hope to Merritt	Limit seems reasonable in winding mountainous sections, but low in other sections. Suggest slow-vehicle warning.
97C	110	Rte. 5A to Westbank	Limit seems reasonable. Suggest slow-vehicle warning.
97	90	Vernon to Monte Creek	Limit seems reasonable.
TCH 1	90	Monte Creek to Sorrento	Limit seems low.
93/95	90	Radium to Athalmer	A previous section with a narrow shoulder is posted at 100, while this section has wide paved shoulders, but is posted at 90.
97	100	Clinton to 100 Mile House	Limit seems reasonable.
TCH 16	100	Prince George to Vanderhoff	Limit seems reasonable.
97	100	Prince George to Bear Lake	Limit seems reasonable.

Figure 3. Operating speeds indicate the 110 km/h limit on this rural freeway should be raised to 120 km/h.

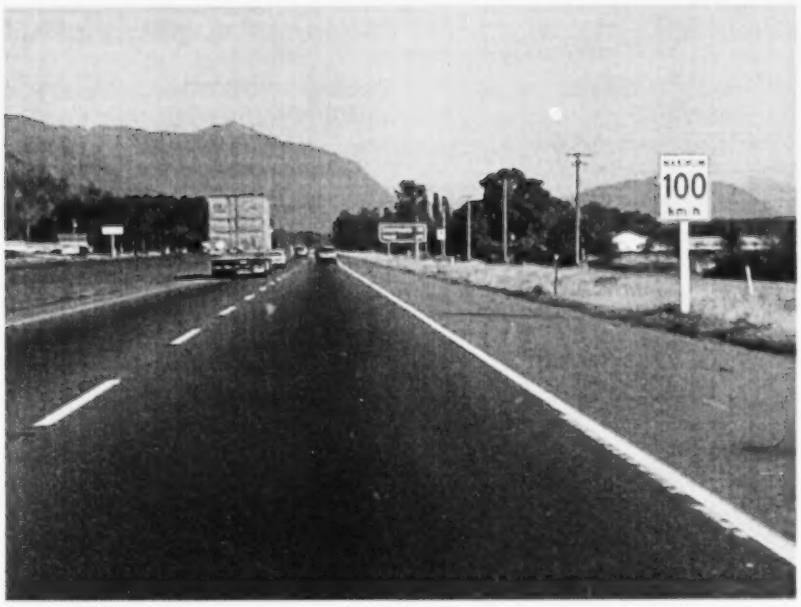

Figure 4. Operating speeds indicate the 100 km/h limit on this rural freeway should be raised to 110 km/h.

In response to the second part of the question, speed limits are consistent when highway segments with similar geometrics, roadside development, traffic, and safety characteristics have the same posted speed limit. Accordingly, for similar road segments, the same posted speed limit should exist from region to region or road type to road type. While the majority of the rural two-lane highway system is posted at 90 or 100 km/h, there are notable inconsistencies with some segments, even within the same region. Within the limitations of the available road geometry information, these segments have been identified and are listed in the tables given in response to the second Ministry question. It is recommended that these limits be reviewed by MoT and revised where appropriate. Changes in the limits on segments that include municipalities should be made with consultation with the appropriate authorities.

Question 2. Are there areas where speed limits should be changed (raised or lowered)?

The field review and the results of the assessment of speed zones provided guidelines for identifying segments were speed limits should be changed. It should be noted, however, that the segments shown in the tables in this section are listed as candidate segments. Before MoT considers changing the limits, it is important that the segment be reviewed in the field and additional information such as speed studies, frequency of access points, pedestrian activity and other speed zoning data be collected and analyzed. This review is necessary because a number of errors were found in the initial listing including incorrect speed limits, inappropriate road classification, geometry that does not match the field review or photolog data, crash data that appears to be questionable, etc.

Due to space limitations, the following tables only provide some of the information that was used in selecting candidate segments. The complete table is provided to MoT on a CD that also contains the other project documents.

As shown below, there are four general categories of segments where speed limit changes are suggested.

Raise Speed Limits from 110 km/h to 120 km/h

As previously mentioned, high-speed rural freeway segments designed with wide medians or median barriers, wide paved shoulders, and full control of access are candidates for increasing the speed limit from 110 km/h to 120 km/h. Existing segments that are included in this category are shown in Table 4. There are 18 road segments in this group comprising a total of 365 kilometers. These segments are located in the South Coast and Southern Interior Regions.

Raise Speed Limits from 100 km/h to 110 km/h

Road segment candidates that should be considered for 110 km/h speed limits include freeway sections that are multilane divided facilities with wide paved shoulders and the other features of a limited access freeway. However, some of the candidate sections in this group may have a very limited number of at-grade intersections. The intersections should have separate left- and right-turn lanes where appropriate, and signal warning systems should be installed at all signalized locations. The speed limit in the vicinity of the signalized intersection may be

reduced as discussed later in this report. As shown in Table 5, there are 14 speed zone segments with a total length of 256 kilometers that fall into this general group. As is the case with the other freeway facilities, these segments are located in the South Coast and Southern Interior Regions.

Raise Speed Limits from 90 km/h to 100 km/h

Road segment candidates that should be considered for 100 km/h speed limits are other multilane facilities with or without a paved median, but with paved shoulders greater than 1.5 meters and with infrequent access points. The higher design two-lane roads with paved shoulders at least 1.5 meters wide and infrequent access points also are included in this category. Shown in Table 6 are candidate segments for this group. There are 35 of these segments with a total length of 689 kilometers. The segments are currently posted at 90 km/h and are located throughout the Province.

The maximum speed limit for a high-speed two-lane road with a paved shoulder width of 1.5 meters or greater in level terrain was examined. The posted speed limits on the majority of the rural Provincial two-lane segments are 90 km/h and 100 km/h. Based on numerous speed limit studies conducted in the United States, the 85th percentile speeds on two-lane tangent segments ranged from 93 km/h to 104 km/h.[5] Actual 85th percentile speeds reported on British Columbia highways ranged from 92 to 111 km/h. The evidence suggests that a maximum speed limit of 105 km/h for rural two-lane highways is appropriate. However, as the MoT posts limits in 10 km/h increments, the maximum limit for rural two-lane segments should remain at 100 km/h.

Lower Speed Limits from 100 km/h to 90 km/h

Consideration should be given to lowering the existing limit from 100 km/h to 90 km/h on the road segments shown in Table 7. These eight segments have paved shoulders that are generally less than 1 to 2 meters wide. Speed data were not available for the segments, thus it is not possible to determine if there is other justification or need to lower the speed limit.

Table 4. Candidate road segments for 120 km/h speed limit.

ID	Hwy	Region	Speed Zone, Km/h	Start Segment	Start Km	Dir	Start Description	End Segment	End Km	End Description	Segment Length, Km	ADT
70	1	Southern Interior	110	2055/20 50	0.00	E W	Jctn of Route 5A	2055/20 50	6.15	40m S of the Iron Mask Bridge	6.15	6,165
266	5	South Coast	110	2000/20 05	5.90	SN	200 m S of the Bridge over the Coquihalla Rv at Peerce Ck I/C	2000/20 05	24.75	Fraser Valley - Nicola Dist. Bdy (actual TP @ seg 2050, 1.07 km)	18.85	5,402
267	5	Southern Interior	110	2000/20 05	24.75	SN	Fraser Valley - Nicola Dist. Bdy (actual TP @ seg 2050, 1.07 km)	2000/20 05	46.98	1.3 km South of the Toll Booths	22.23	5,200
270	5	Southern Interior	110	2000/20 05	48.88	SN	600m North of the Toll Booths	2000/20 05	109.5 8	Coldwater U/P South End	60.70	4,279
271	5	Southern Interior	110	2010/20 15	0.00	SN	Coldwater U/P South End, Merritt	2010/20 15	3.98	Nicola U/P South Side	3.98	3,233
272	5	Southern Interior	110	2020/20 25	0.00	SN	Nicola U/P South Side, Merritt	2020/20 25	72.28	Afton U/P	72.28	3,094
273	5	Southern Interior	110	2050/20 55	0.00	W E	Afton U/P, Kamloops	2050/20 55	0.03	510m west of Iron Mask Sign Bridge, Kamloops	0.03	4,757
584	19	South Coast	110	2343/23 44	1.10	SN	1.10 km North of Rte 19A O/P at Craig's Crossing I/C	2343/23 44	5.56	Route 4A O/P	4.46	8,284
586	19	South Coast	110	2351/23 52	0.19	SN	185m North of Route 4A O/P	2351/23 52	8.96	Hwy 4 Overpass	8.78	7,094
587	19	South Coast	110	2353/23 54	0.00	SN	Hwy 4 Overpass	2353/23 54	25.94	600m South of Cook Creek Road	25.94	3,984
589	19	South Coast	110	2353/23 54	27.09	SN	550m North of Cook Creek Road #1828	2353/23 54	40.37	Buckley Bay Road	13.28	3,906
590	19	South Coast	110	2347/23 46	0.00	SN	Buckley Bay Road	2347/23 46	18.72	Comox Valley Parkway O/P (South End)	18.72	2,487
591	19	South Coast	110	2373/23 74	0.00	SN	Comox Valley Parkway O/P (South End)	2373/23 74	8.77	700m South of Piercy Road #129	8.77	0
593	19	South Coast	110	2373/23 74	10.08	SN	600m North of Piercy Road #129	2373/23 74	12.41	660m South of Dove Creek Road #105	2.33	0
597	19	South Coast	110	2373/23 74	27.01	SN	710m North of Hamm Road #424	2373/23 74	35.48	480m South of Cranberry Lane #1245	8.47	0
599	19	South Coast	110	2373/23 74	36.39	SN	420m North of Cranberry Lane #1245	2373/23 74	43.00	560m South of Jubilee Parkway #1840	6.61	0
602	19	South Coast	110	2365/23 66	0.47	SN	470m North of Jubilee Parkway	2365/23 66	6.29	310m South of Willis Road #722	5.82	8,234
106 1	97C	Southern Interior	110	2035/20 30	1.35	E W	4.59 km East of the start (East End) of Trepanier Creek Bridge	2035/20 30	80.99	970m East of the Junction with Route 5A at Aspen Grove	79.64	1,874

18 Number of Speed Zones

Table 5. Candidate road segments for 110 km/h speed limit.

ID	Hwy	Region	Speed Zone, Km/h	Start Segment	Start Km	Dir	Start Description	End Segment	End Km	End Description	Segment Length, Km	ADT
22	1	South Coast	100	792/791	0.31	WE	West Abutment of Hope Overpass *	792/791	35.17	Bridal Veil U/P #2430	34.86	7,29
23	1	South Coast	100	575/572	0.00	WE	Bridal Veil U/P #2430	575/572	39.91	150 m West of Whatcom Road in Abbotsford	39.91	14,14
24	1	South Coast	100	575/572	39.91	WE	150 m West of Whatcom Road in Abbotsford	575/572	43.51	Entrance from Route 11	3.60	15,30
25	1	South Coast	100	576/571	0.00	WE	Entrance from Route 11	576/571	6.65	Peardonville Road U/P #1615	6.65	24,58
26	1	South Coast	100	577/570	0.00	WE	Peardonville Road U/P #1615	577/570	2.30	Mt. Lehman U/P #1562	2.30	29,87
27	1	South Coast	100	555/550	0.00	WE	Mt. Lehman U/P #1562	555/550	30.07	460m W of the WB on-ramp taper (NW Quad) at 176th St. (Clover V. Rd) I/C	30.07	31,04
74	1	Southern Interior	100	925	5.47	WE	500m East of Tanager Road	925	25.90	Junction Route 97	20.43	15,05
106	3	South Coast	100	1301/1302	0.55	EW	West Abutment of Hope Overpass	1301/1302	6.67	Exit to Route 5	6.12	4,64
107	3	South Coast	100	1303/1304	0.00	EW	Exit to Route 5	1303/1304	1.18	400 m West of Nicolum Creek Provincial Park Access Road	1.18	1,64
129	3	Southern Interior	100	1310	60.66	WE	1.93 km West of Ashnola Road # 18	1310	63.94	200m West of 10th Ave	3.28	3,43
265	5	South Coast	100	2000/2005	0.00	SN	At the Jct w/ Rte 3 EB at the Othello I/C, Hope	2000/2005	5.90	200 m S of the Bridge over the Coquihalla Rv at Peerce Ck I/C	5.90	3,70
889	97	Southern Interior	100	1115	15.87	SN	1.25 km north of West Bench Hill Road	1115	22.82	150m South of Experimental Farm Access	6.95	13,44
933	97	Southern Interior	100	1130	41.38	SN	700m North of #233 West Road (south)	1130	110.38	900m North of the BCR O/P # 0015	69.00	3,62
1065	99_1	South Coast	100	2910/2915	1.26	SN	400 m South of 8th Avenue U/P	2910/2915	27.11	850 m South of Route 17 U/P	25.85	19,16
									14	Number of Speed Zones	256.10	km cu

Table 6. Candidate road segments for 100 km/h speed limit.

ID	Hwy	Region	Speed Zone, Km/h	Start Segment	Start Km	Dir	Start Description	End Segment	End Km	End Description	Segment Length, Km	ADT
30	1	South Coast	90	555/550	39.17	WE	310 m West of the Wesbound On Ramp Taper at the Cape Horn I/C	555/550	52.48	610 m East of the centre of Willingdon Ave. Overpass in Burnaby	13.31	51,29
36	1	South Coast	90	508/506	0.00	EW	Taylor Way O/P West Abutment	508/506	10.43	20 m W of the W end of the Nelson Creek Bridge Deck	10.43	18,53
42	1	South Coast	90	905	2.31	EW	320 m East (North) of the East (North) end of the Fraser River Bridge	905	21.77	90 m West of Gordan Creek Multplate	19.46	5,04
68	1	Southern Interior	90	920	29.88	WE	1.24 km West of Deadman / Vidette Road	920	71.99	Afton O/P	42.11	4,24
76	1	Southern Interior	90	935	1.80	WE	1.0 km West of Bostock Road	935	47.36	160m West of Pachendale Road	45.56	7,59
91	1	Southern Interior	90	960	31.81	WE	2.84 km East of Perry River Bridge	960	70.00	150m W of Jct with Rte 23 (S) - Galena Bay Hwy at Revelstoke	38.19	5,59
95	1	Southern Interior	90	975	1.67	WE	1.47 km E of the Jct with Rte 23 (N) Mica Ck Hwy	975	48.35	At West Bdy of Glacier National Park	46.68	5,35
96	1	Southern Interior	90	980	0.00	WE	At West Bdy of Glacier National Park	980	43.81	At East Bdy of Glacier National Park	43.81	5,35
122	3	Southern Interior	90	1310	1.00	WE	230m East of Copper Mt. Road	1310	6.28	1.6 km East of Taylor Way # 68	5.28	3,64
134	3	Southern Interior	90	1320	1.32	WE	310m West of Willis Road	1320	8.23	200m East of Armstrong Drive	6.91	1,80
381	7	South Coast	90	2755	25.34	WE	200 m West of the Access to the Rest Area Pullo Out W End	2755	30.43	Junction with Route 1 (TCH) at Hwg Interchange	5.09	2,57
476	16	Northern	90	1515	0.00	WE	Route 37	1515	16.53	300m W of the W Jct of Kitsequecla Access (Old Rte 16)	16.53	1,44
480	16	Northern	90	1515	26.89	WE	110m West of the Junction with Carnaby Road	1515	42.27	700m West of Jct with Hazelton Hi - Level Rd	15.38	2,72
490	16	Northern	90	1520	37.53	WE	1 km East of Telkwa High Rd	1520	60.52	183m West of the West Jct of Lake Kathyn Rd W	22.99	3,93
558	17	South Coast	90	3172	6.10	SN	100 m North of 56th Street	3172	11.14	500 m South of Route 10	5.04	37,59
564	17	South Coast	90	304/307	14.61	SN	500m North of Island View Road	304/307	22.59	300m North of Pedestrian Overpass at Weiler Ave	7.98	16,40
647	20	Southern Interior	90	3320	3.58	WE	2.7 km East of Anahim Street	3320	17.81	900 m East of Nimpo Lake North Road	14.23	19
651	20	Southern Interior	90	3320	19.81	WE	2.903 km East of Nimpo Lake North Road	3320	94.10	915 m West of W.R. Graham Road	74.29	23
656	20	Southern Interior	90	3330	1.73	WE	668 m East of Tatlayoko Lake Road	3330	39.22	150 m West of Chipman Road	37.49	35
715	24	Southern Interior	90	1749	11.25	WE	220m East of the Junction with Lone Butte-Horse Lake Road	1749	83.02	1.83 km East of Latremouille Lake Access	71.77	1,17
830	91	South Coast	90	3020/3025	0.00	EW	E Channel Bridge S. Abut (Alex Fraser Bridge)	3020/3025	8.42	900 m East of the East abut of the No. 6 Road O/P	8.42	30,15
892	97	Southern Interior	90	1115	24.38	SN	450m North of Tait Road	1115	28.06	250m South of Solly Road	3.68	13,68
938	97	Southern Interior	90	1140	0.92	SN	1.0 km South of Canim-Hendrix Lake Road	1140	4.93	500m North of 103 Mile Lake Road Intersection	4.01	9,07
943	97	Southern Interior	90	1140	26.27	SN	730m North of Felker Road	1140	35.03	200m South of Doyle Road South Intersection	8.76	5,03
945	97	Southern Interior	90	1140	39.56	SN	870m North of Lac La Hache Provincial Park Entrance	1140	42.55	1.6 km North of Wright Station Road	2.99	5,27
955	97	Southern Interior	90	1145	5.29	SN	260m North of Acher Road and Commodore Crescent	1145	14.15	240 M North of Westcoast Road	8.86	4,24
986	97	Northern	90	1160	13.93	SN	4.32 km N of Kennedy Road	1160	34.81	500m N of BCR O/P	20.88	1,60
988	97	Northern	90	1160	60.00	SN	170m S of Bennett Creek H899P	1160	71.00	620m S of Link Creek Bridge Centre	11.00	96
1004	97	Northern	90	1175	58.17	SN	100m N of Birch Ave at Taylor	1175	62.95	1.0 km South of B.C.R. Underpass	4.78	5,51
1006	97	Northern	90	1175	64.10	SN	150m North of B.C.R. Underpass	1175	69.76	875m North of the Junction with Road # 146 Bypass	5.66	8,05
1009	97	Northern	90	1180	4.03	SN	200m North of the Junction with Road # 269-B	1180	7.13	480m South of the Junction with Sunnyside Drive # 120	3.10	5,04
1011	97	Northern	90	1180	8.11	SN	150m North of Old Hope Road No 119	1180	11.68	840m South of the Route 29 Intersection	3.57	5,04
1058	97C	Southern Interior	90	1714	0.55	NS	550m North of the Junction with Route 8	1714	41.50	500m South of Meadow Creek Road/Tunkwa Lake Road Intersection	40.95	79
1067	99_1	South Coast	90	2910/2915	32.29	SN	600 m North of Steveston Hwy O/P in Richmond	2910/2915	38.49	At Bridgeport Rd Exit	6.20	30,76
1080	99_5	South Coast	90	2930	7.74	SN	400 m North of Depot Road	2930	21.18	200 m South of Culliton Creek Bridge	13.44	7,71
									35	Number of Speed Zones	688.82	km cur

Table 7. Candidate road segments for 90 km/h speed limit.

ID	Hwy	Region	Speed Zone, Km/h	Start Segment	Start Km	Dir	Start Description	End Segment	End Km	End Description	Segment Length, Km	ADT
116	3	Southern Interior	100	1305	113.48	WE	1.55 km East of Whipsaw Bridge	1305	120.26	1.2 km East of Wrights Road	6.78	2,80
147	3	Southern Interior	100	1325	71.69	WE	100m E of Jesolin Street	1325	82.65	480m West of First Street, Greenwood	10.96	3,21
239	3B	Southern Interior	100	1335	0.00	WE	At Junction with Route 3 @ Nancy Greene Lake	1335	23.19	425m West of Mann Road	23.19	85
265	5	South Coast	100	2000/2005	0.00	SN	At the Jct w/ Rte 3 EB at the Othello I/C, Hope	2000/2005	5.90	200 m S of the Bridge over the Coquihalla Rv at Peerce Ck I/C	5.90	3,70
479	16	Northern	100	1515	18.60	WE	900m East of East Abut of the Kitsegukla Bridge	1515	26.89	110m West of the Junction with Carnaby Road	8.29	2,06
710	23	Southern Interior	100	977	15.13	SN	1.9 km S of Martha Creek Park	977	150.60	150.61 km North of the Jct with Route 1	135.47	62
836	93	Southern Interior	100	2110	3.63	SN	3.20 km N of Davis Road	2110	10.96	3.45 km N of McDonald Loop Road	7.33	71
855	95	Southern Interior	100	2160	28.57	SN	370m North of Brisco Road	2160	39.34	270m South of Westside Road	10.77	1,10
										8 Number of Speed Zones	208.69 km cur	

Question 3. Are there areas where the speed limit could be eliminated?

In the northern region of British Columbia, there are vast segments of rural highway that carry less than 500 vehicles per day. Examples include Route 37 from Kitimat to the Yukon border and Route 97 from Fort Nelson to the Yukon border. Most of these segments are two-lane paved roads with some gravel sections, which have little roadside signing and sparse roadside development. It is possible that posted speed limits have little impact because they do not provide useful information that the driver needs to negotiate the rural area, especially during night time and inclement weather conditions. Consideration can be given to eliminating the posted speed limits on these sections, however, there are concerns that drivers will increase speeds, and consequently, crashes may increase.

A literature search identified only one study that examined speed limits in remote areas.[4] Because little data was available, the authors offered the opinion that increasing the speed limit in remote areas of Australia could result in an increase in vehicle speeds and a likely increase in accident number and severity.

Due to the vast distances involved, it was not possible for the authors of this report to conduct a field review of the northern Provincial routes. Photolog information, where available, was reviewed. The segments have shoulder widths that vary from 0 to 1.5 meters and a variety of road surface conditions.

In addition to examining geometric conditons, crash information for the 5-year period 1997 through 2001 was examined. During the crash study period, the frequency of crashes was very low, i.e., typically approximately 0.05 crashes per kilometer per year which is equivalent to approximately 1 crash per kilometer every 20 years. It should be noted, however, that due to the remoteness of the area, it is probable that minor property damage only crashes are not reported, which distorts the true crash picture.

Due to the low volumes, sparse access points and roadside information, and apparent low crash frequencies, it is the opinion of the authors of this report that consideration should be given to eliminating a posted speed limit in these remote areas. Before implementation, it is also important that the basic speed rule be enacted as discussed in a subsequent section of this report. Furthermore, because Route 97 is a Federal government road, it would be necessary to coordinate this matter with the Federal agency.

It is also important that should the decision be made to eliminate the speed limit in remote areas that consideration be given to informing the public of this condition by signing. It is anticipated that public information and press releases will be to various media outlets, but roadside signing should also be erected. Although a variety of possible sign messages could be used, it is suggested that the message "**NOTICE No Posted Speed Limits Ahead Drive at a Safe and Reasonable Speed for Conditions**."

OTHER SPEED-RELATED FINDINGS

During the course of the investigation, a number of issues and speed-related items that are relevant to an effective speed management program were discovered. While these findings do not directly have an effect on the responses to the three Ministry questions, the authors felt that they are important issues that should be discussed in a separate section of the report. The other speed-related issues are briefly discussed in the following paragraphs.

Speed Limits on Road Segments in Adverse Mountainous Terrain

There are a number of road segments in British Columbia that cross the mountain ranges. For example, shown in Figure 5 is a segment of Route 3 in adverse mountainous terrain just east of Osoyoos.

Characteristics of these two-lane mountainous segments include grades which frequently exceed 9 percent, winding horizontal curves with 30 km/h to 60 km/h posted advisory limits, and the frequent use of climbing and passing lanes. While some of these segments are posted at 90 km/h, few vehicles can safely be maneuvered near that speed. Consideration should be given to determining the maximum safe speed limit for these adverse mountainous segments. The study should include the collection and analysis of free-flow vehicle speeds, geometrics, traffic volumes, heavy vehicle use, and crash data. The 85th percentile speed in a tangent section should be used as a guideline in determining the posted speed limit.

To the author's knowledge there is no inventory available that can be used to precisely identify the adverse mountainous segments. Based on the results of the field review, it is estimated that there are approximately two adverse segments on THC-1 and three on Route 3 in the Province. The number of adverse mountainous segments on the other primary and secondary routes is unknown, but may total as much as 50 to 100 kilometers, consequently it is not a major issue.

Speed Limits at Signalized Intersections on Rural Freeways

In order to construct as many kilometers of freeway as possible with limited resources, some rural freeways in the Province contain at-grade intersections with traffic signals. Because motorists typically do not anticipate that they may have to come to a complete stop on a freeway, the Ministry utilizes an active Stop-for-Signal Ahead warning system and a general speed limit of 90 km/h or less depending upon conditions. Based on observations and a review of the available data, the author's concur with this treatment for this special condition. The warning system coupled with a reduced speed zone appears to be effective in obtaining the desired response from motorists. Due to the high speeds found on rural freeways, there is always a risk of a serious collision, and the crash history at these locations should be monitored on a periodic basis so that additional actions can be employed if necessary.

It is important that the reduced speed zones are set on the basis of an engineering study, and the advance warning system be appropriately timed for existing operating and roadway design conditions. To obtain motorist compliance and respect for this special condition, the use of reduced speed zones greater than one kilometer in length should be discouraged.

Figure 5. Route 3 segment in adverse mountainous terrain near Osoyoos.

Two basic conditions were identified as a result of the field reviews. The first case is where a signal is installed on the freeway in close proximity or adjacent to a reduced speed zone in a built-up or urban area. When conducting a speed limit investigation at a signalized intersection on a freeway segment adjacent to or near another reduced speed zone segment, the data that should be collected include the speeds of free-flow vehicles approaching the intersection, traffic volumes, crash data, signal and warning signal timing, and sight distance restrictions, if any. After consideration of all factors, the posted reduced speed limit should be set as close to the 85th percentile speed of approaching vehicles as possible, but not greater than 90km/h.

The second situation identified is where a signalized intersection is located on a rural freeway, but there are no adjacent reduced speed zones or reasons for reducing speed limit except for the signalized intersection. In this situation, the 85th percentile vehicle approach speeds are likely to be much higher than the 90 km/h maximum limit at signalized intersections. Although voluntary motorist compliance with the reduced speed limit is probably not going to be achieved, this condition is unique and warrants a maximum 90 km/h limit. It should be noted that 80 km/h or 90 km/h limits maximum limits at signalized intersections are also used in other Canadian Provinces including Alberta, Manitoba, and Quebec.

Transition Zones

Current practice in British Columbia is to use a transition speed zone in a rural area when entering or leaving an urban or built-up area. Most transition zones are typically less than one kilometer in length, but there are cases when the zones are two kilometers or more. For

example, shown in Figure 6 is a transition zone which was extended beyond the developed area into the rural area.

Based on the author's field review of numerous transition zones, and the limited speed data available for existing zones, it appears that motorists do not slow down in the transition zone because the limit is not based on road geometry and roadside development. Accordingly, the effectiveness of such zones is questionable. Consideration should be given to eliminating the transition zones where they are not supported by associated changes in road geometry, access points, etc. In other words, the speed limit should be based on conditions that are visible to the driver. The use of speed limit change ahead signs by MoT when speed limits are lowered for road geometry, roadside development, parking, pedestrian activity, etc. is a desirable and necessary practice.

Figure 6. Transition zone speed limit in a rural area.

Advisory Speed Limits at Night

According to the crash data provided in the Wildlife Accident Reporting System, 4,768 wildlife related crashes occurring in the Province during the year 2000.[6] This represents a significant crash problem to humans and the native animals. While a number of mitigation efforts are used, including specific animal warning signs, it was observed during the field review that advisory night speed limits are posted on some Provincial roads. The frequent movement of animals, especially at night and related crash debris was particularly evident on some routes such as Route 3 south of Golden.

The author's were not successful in their attempt to find any information relative to the effectiveness of these advisory limits. Due to the size of some native wildlife species and their unexpected movements during darkness, consideration should be given to posting advisory night speed limits on some rural segments where wildlife crashes have been reported on a

reoccurring basis. These limits should be posted on an experimental or trial basis and before and after studies conducted to determine their effectiveness. Based on number of animal incidents and the need to take appropriate action to prevent a crash, it is suggested that advisory nighttime speed limits be posted 20 km/h below the maximum posted limit.

Design Speed vs Operating Speed

As previously noted, speed limits are set on the basis of the 85th percentile operating speed determined by speed surveys taken of free-flow vehicles during good weather and traffic conditions. This speed can often exceed the design speed of the roadway segment. Some authors have concerns about setting speed limits higher than design speeds. It should be noted, however, that design speeds are based on large margins of safety which include designing horizontal curves for wet pavement conditions. Typically the design speed of a highway underestimates the maximum safe speed for the segment.[7]

Basic Speed Law

A review of the *Motor Vehicle Act* suggests that motorists must not exceed the statutory or posted speed limits in the Province. Excessive speeding is defined as driving at a speed greater than 40 km/h over the applicable limit. Careless driving is prohibited, i.e., a person must not drive a motor vehicle on a highway at a speed that is excessive relative to the road, traffic, visibility or weather conditions. While similar laws exist in the United States and other countries, most countries also have a basic speed rule which requires a motorist to drive at a speed that is reasonable and prudent for existing conditions. The purpose of the basic speed rule is to place the responsibility of speed choice on the driver who is in a better position to assess existing conditions and take appropriate action. Note that the basic speed law tells a driver he or she shall drive a reasonable and prudent speed for conditions. It is not a prohibited condition such as the "excessive speeding" or "careless driving law."

For informational purposes, a summary of the United States Uniform Vehicle Code and individual State laws pertaining to vehicle speeds and speed limits is given at the following web site.

http://www.nhtsa.dot.gov/people/injury/enforce/speedlaws501/introduction.htm

In the States, the basic speed law tells the driver how they SHALL manage the speed of their vehicle. For example the Uniform Vehicle Code lists the Basic Speed Rule as a basis for a speed law violation as follows:

> "No person shall drive a vehicle greater than is reasonable and prudent under the conditions and having regard to the actual and potential hazards then existing."

In Michigan, the basic speed law is:

> "A person shall operate a vehicle at a careful and prudent speed not greater than nor less than is reasonable and proper, having due regard to the traffic, surface, and width of the highway and of any other condition then existing."

Also within the speed laws of each State are the "excessive speeding," "minimum speed rule," "racing," and other prohibited driver actions. British Columbia also has laws concerning "careless driving prohibited," slow driving," and "excessive speeding." These laws tell the driver what is PROHIBITED or what is not allowed.

On the other hand, the basic speed law tells the driver what they SHALL do at all times, with and without statutory limits or speed limit signs, i.e., drive at a reasonable and prudent speed for conditions. This puts the responsibility of selecting a safe speed always on the driver and not on the Province or jurisdiction. For example, a driver could be operating at a speed less than the posted speed limit, but could be in violation of the basic speed law because of heavy traffic or adverse weather conditions.

Section 144 (1) (c) of British Columbia law entitled "Careless driving prohibited," states that "a person must not drive a motor vehicle on a highway...at a speed that is excessive relative to the road, traffic, visibility or weather conditions." Again, this is a PROHIBITED condition. This section does not specifically tell the motorist to drive at a reasonable and prudent speed for conditions. In addition, careless driving also covers many other driver actions which are not necessarily related to vehicle speed.

Enactment of a basic speed rule is suggested for British Columbia. Currently a motorist may be operating below a fixed maximum limit set by the Province, but exceed the reasonable speed for conditions. Appropriate adjudications for violations of the basic speed law should also be established.

Warning Flashers on Slow Moving Vehicles

The Ministry currently uses a grade advisory system to encourage management of heavy vehicle speeds in mountainous areas. Escape ramps or turnouts are provided where possible for runaway vehicles. These are excellent examples of speed management in difficult terrains.

On some downgrades, the Ministry advises trucks to use emergency four-way flashers to warn motorists of their slow speed. However, trucks, busses, recreational vehicles, and other motorists often travel much slower than other vehicles on upgrades. In the United States and other countries, motorists in mountainous areas who travel less than 50 km/h or 60 km/h, either upgrade or downgrade, are required to turn on their emergency flashers. These warning systems have been found to be effective in reducing conflict situations.[8] The objective of the four-way flashers is to improve vehicle conspicuity in order to increase driver awareness of a slow moving vehicle and permit time for the driver to react appropriately by reducing speed or changing lanes. Enactment of similar legislation is suggested for British Columbia.

Other Speed Related Mitigation Efforts

Traveling throughout the Province provided an insight into many other design and traffic control efforts the MoT has taken to mitigate and/or accommodate vehicle speeds. These are items the MoT is doing that are equal to or better than agencies in many other countries. Some of the more pertain features are listed below.

As previously mentioned, at every traffic signal on a high-speed (70 km/h and above) road that was examined, the MoT had installed an active warning system that advised

motorists about the operation of the signal, including providing sufficient time to slow down and stop during the amber phase. This is an important safety feature that is especially effective when freeway and expressway type road segments have at-grade crossings.

There is considerable use of right-and left-turn lanes for at-grade intersections. These speed change lanes provide safety enhancements by removing the slow speed turning vehicles from the high-speed through vehicles thereby reducing speed variance.

Clearly defined access management techniques have been used in small towns, cites, and other locations with roadside development along the Provincial highway system. Some communities have made significant progress with the installation of access management features, while other communities have made little visible progress. One primary technique employed is to reduce the number of commercial driveways and define the location of the primary driveway through the use of concrete barriers. Limiting the number and location of driveways also improves traffic flow and reduces collisions due to slowing and turning traffic.

EFFECTS OF RAISING RURAL SPEED LIMITS FROM 90 TO 100 KM/H

The Ministry of Transportation has a proactive history of managing speed. During 1996 a Phase I review of speed limits was undertaken on major highway corridors. As a result, speed limits were raised from 90 km/h to 100 km/h on approximately 2,000 kilometers of road. During 1997, Phase II reviews were conducted. As a result, speed limits were raised from 90 km/h to 100 km/h on approximately 1,870 kilometers of Provincial highway. A before and after analysis conducted in 1999 suggested that average speeds increased by 3.2 km/h to 4 km/h on segments were speed limits were raised.[9] There was insufficient crash data to determine the effects of the speed limit change on accidents.

In order to examine the effects of speed limit changes on speeds and crashes, a review and assessment was made of the available information. The speed analysis is shown below, followed by the crash analysis.

Effects on Speed

A review was made of speed data collected at three ICBC monitoring sites where speed limits were raised (test sites) and three sites where speed limits were not raised (control sites). The results of the analysis are shown in Figure 7. It should be noted that the 85th percentile speeds shown in Figure 7 are binned speeds, i.e., speeds that range from one interval to the next one, and not point estimates. For example, an 85th percentile bin speed of 105 to 110 km/h means that the 85th percentile speed is contained in the 105 km/h to 110 km/h bin. As illustrated in Figure 7, 85th percentile speeds did not change at the Pipers Glen test site during the 3-year period 2000 to 2002. The speeds did increase at the Willow Flats and Clinton test sites for at least one of the years examined. On the other hand, during 2002, the 85th percentile speeds increased at all three control sites. Consequently, it is possible that the speed increases at the test sites are due to normal fluctuations in speeds and not to the fact that the speed limit was raised.

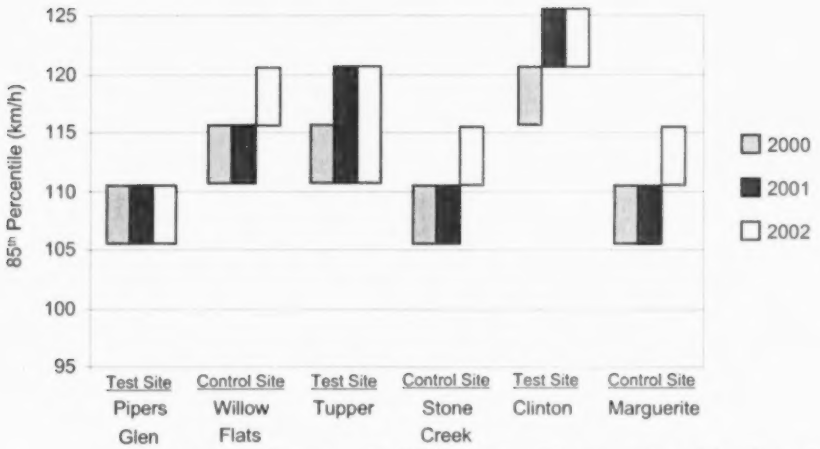

Figure 7. Changes in 85th percentile speeds at test and control sites.

Based on a review of the literature, it has been reported that when speed limits are raised from 90 km/h to 105 km/h, that vehicle speed increase from 0.3 km/h to as much as 8 km/h.[10] The average increase appears to be between 4 km/h and 6 km/h. Consequently, the speed limit changes at the Ministry sites are similar in magnitude to the changes found by other investigators.

Effects on Crashes

A before and after with control group analysis of crashes reported on highway segments where speed limits were raised during the years 1997 and 1998 was conducted. The paired comparison ratio method was used to estimate the overall effect of the speed limit change using a weighted average log odds ratio based upon the individual log odds ratios of the crash counts at the individual treatment segments.[11]

The results of the analysis are shown in Table 8 for the Phase I sites and in Table 9 for the Phase II sites. Based on the analysis, it appears that raising the limit from 90 km/h to 100 km/h resulted in a 12.9 percent reduction in crashes at the sites where speed limits were raised. The Phase II sites experienced an 8.6 percent reduction in total crashes. Both reductions are statistically significant.

The reduction in total crashes at the test sites in British Columbia did not follow the same trends found in most other crash investigations. As a means of comparison, shown in Table 10 is a summary of the effects of lowering speed limits on crashes. The effects of raising speed limits are shown in Table 11. In general in other countries, studies of the effects of raising speed limits generally indicate that vehicle speeds and crashes increase, but much of the data is from freeways in the United States and much of the crash data is for fatal crashes. Due to the relative low number of fatal crashes in British Columbia during the study periods, only total crashes were considered in the analysis.

Based on the crash analysis at the Phase I and Phase II sites, it is concluded that raising the speed limits from 90 km/h to 100 km/h at these locations apparently did not have an adverse effect on safety. It is possible that other factors unrelated to the speed limit influenced the crash reductions.

Table 8. Phase I crash results.

BRITISH COLUMBIA MINISTRY OF TRANSPORTATION SPEED LIMIT STUDY
Paired Comparison Analysis

Site Number	Treatment Crashes Before	Treatment Crashes After	Comparison Crashes Before	Comparison Crashes After	Comparison Ratios C	B*	Percent Change	Z	L	w	wL	$(L-Lt)^2$	$w(L-Lt)^2$	wL^2
90	104	80	51	15	0.23	23.45	241.2	3.70	1.2272	9.0837	11.1477	1.8636	16.9281	13.6808
284	51	47	57	51	0.81	41.24	14.0	0.46	0.1307	12.6411	1.6526	0.0722	0.9122	0.2161
288	132	119	18	10	0.90	119.03	0.0	0.00	-0.0003	5.7193	-0.0016	0.0189	0.1083	0.0000
290	281	249	71	26	0.46	130.62	90.6	2.54	0.6451	15.5220	10.0137	0.6131	9.5171	6.4601
463	23	7	4	1	0.20	4.51	55.1	0.37	0.4389	0.6944	0.3048	0.3327	0.2310	0.1338
464	23	8	28	34	1.00	23.00	-65.2	-2.17	-1.0560	4.2176	-4.4537	0.8429	3.5550	4.7031
465	88	42	33	11	0.37	32.34	29.9	0.65	0.2615	6.2706	1.6397	0.1595	1.0002	0.4287
474	90	30	29	8	0.20	18.23	64.5	1.09	0.4979	4.8275	2.4035	0.4042	1.9514	1.1967
480	44	17	19	10	0.36	15.73	8.1	0.16	0.0775	4.2533	0.3298	0.0464	0.1974	0.0256
486	48	42	15	6	0.38	18.22	130.6	1.58	0.8353	3.5794	2.9899	0.9472	3.3902	2.4975
500	131	80	191	141	1.04	136.85	-41.5	-2.93	-0.5368	29.7731	-15.9832	0.1591	4.7383	8.5803
506	102	33	42	17	0.48	48.85	-32.4	-1.11	-0.3923	8.0049	-3.1403	0.0647	0.5181	1.2320
508	78	43	69	70	0.86	51.23	-16.1	-0.68	-0.1752	15.0904	-2.6434	0.0014	0.0210	0.4630
517	55	56	14	2	0.13	7.03	696.6	2.65	2.0752	1.6276	3.3776	4.8977	7.9717	7.0092
519	11	2	15	17	0.67	7.39	-72.9	-1.54	-1.3075	1.3934	-1.8218	1.3679	1.9060	2.3820
524	30	23	101	38	0.37	11.13	106.6	2.15	0.7255	8.7544	6.3509	0.7454	6.5254	4.6073
529	39	41	28	27	1.24	48.40	-15.3	-0.47	-0.1659	8.0693	-1.3387	0.0008	0.0063	0.2221
534	158	103	108	89	1.28	202.63	-49.2	-3.50	-0.6767	26.7511	-18.1013	0.2903	7.7647	12.2484
544	136	91	48	27	0.60	81.20	12.1	0.40	0.1140	12.4505	1.4192	0.0634	0.7900	0.1618
545	85	79	181	167	1.00	85.24	-7.3	-0.39	-0.0760	26.1651	-1.9896	0.0038	0.1001	0.1513
547	79	62	159	117	0.88	69.15	-10.3	-0.51	-0.1092	21.8808	-2.3890	0.0008	0.0180	0.2608
552	25	26	31	17	0.61	15.38	69.2	1.27	0.5261	5.8279	3.0658	0.4408	2.5692	1.6128
554	130	91	46	26	0.92	119.56	-23.9	-0.96	-0.2729	12.3045	-3.3585	0.0182	0.2244	0.9167
801	34	12	73	40	0.30	10.29	16.6	0.39	0.1537	6.4414	0.9900	0.0850	0.5477	0.1521
802	34	15	192	179	0.79	26.78	-44.0	-1.75	-0.5797	9.1013	-5.2765	0.1952	1.7769	3.0590
806	9	2	34	13	0.32	2.90	-31.1	-0.44	-0.3728	1.3849	-0.5163	0.0552	0.0764	0.1925
840	48	27	170	186	1.09	52.51	-48.6	-2.51	-0.6651	14.2712	-9.4921	0.2780	3.9669	6.3134
845	96	49	214	183	0.76	73.11	-33.0	-1.95	-0.4002	23.8623	-9.5490	0.0688	1.6414	3.8212
853	41	43	85	78	0.98	40.23	6.9	0.24	0.0665	13.5365	0.8999	0.0418	0.5654	0.0598
855	15	6	29	39	1.59	23.83	-74.8	-2.54	-1.3792	3.3801	-4.6619	1.5408	5.2081	6.4296
857	32	13	97	92	1.20	38.35	-66.1	-2.98	-1.0818	7.5818	-8.2023	0.8910	6.7556	8.8736
859	32	12	107	84	1.03	32.90	-63.5	-2.71	-1.0085	7.2413	-7.3028	0.7579	5.4885	7.3649
860	23	16	46	37	0.79	18.14	-11.8	-0.32	-0.1253	6.4315	-0.8060	0.0002	0.0010	0.1010
1001	98	105	115	63	0.54	52.81	98.8	3.20	0.6873	21.6724	14.8954	0.6810	14.7579	10.2376
1013	76	55	100	66	0.84	64.06	-14.1	-0.64	-0.1525	17.3393	-2.6446	0.0002	0.0037	0.4034
1015	16	15	34	24	0.89	14.24	5.4	0.12	0.0523	4.9516	0.2589	0.0362	0.1791	0.0135
1018	167	95	26	11	0.76	126.28	-24.8	-0.72	-0.2846	6.3745	-1.8142	0.0215	0.1372	0.5163
1020	54	27	234	105	0.94	50.99	-47.0	-2.39	-0.6357	14.0960	-8.9613	0.2478	3.4936	5.6970
1024	21	9	61	30	0.89	18.63	-51.7	-1.59	-0.7277	4.7563	-3.4613	0.3479	1.6548	2.5190
Total	2,739.0	1,872.0	2,975.0	2,157.0		1,956.46				407.3242	-56.1701		117.1980	124.9439

Lt = -0.1379
Ut = 0.8712
Et = -12.88 Apparent Change in Crashes in Percent
Lse = 0.0495
Z = -2.78
Lower Limit = -0.2350 = 0.7906 = -20.94 95% Lower Limit in Percent
Upper Limit = -0.0408 = 0.9600 = -4.00 95% Upper Limit in Percent

Source	X^2	df
Treatment	7.75	1
Homogeneity	117.20	38
Total	124.94	39

Odds Ratio = -5.73 Apparent Change in Crashes in Percent
Z = -1.43
Lower Limit = -13.05 95% Lower Limit in Percent
Upper Limit = 2.20 95% Upper Limit in Percent

Table 9. Phase II crash results.

BRITISH COLUMBIA MINISTRY OF TRANSPORTATION SPEED LIMIT STUDY
Paired Comparison Analysis

Site Number	Treatment Crashes Before	Treatment Crashes After	Comparison Crashes Before	Comparison Crashes After	Comparison Ratios C	B°	Percent Change	Z	L	w	wL	$(L-L\dagger)^2$	$w(L-L\dagger)^2$	wL^2
54	4	4	26	16	0.52	2.09	91.2	0.84	0.6482	1.6609	1.0767	0.5446	0.9045	0.6979
56	34	15	28	26	0.80	27.27	-45.0	-1.44	-0.5979	5.8287	-3.4847	0.2582	1.5050	2.0833
59	120	104	28	27	1.13	136.17	-23.6	-0.89	-0.2695	10.8882	-2.9347	0.0323	0.3521	0.7910
61	79	63	108	89	0.92	72.64	-13.3	-0.64	-0.1424	19.9997	-2.8488	0.0028	0.0556	0.4058
62	6	6	5	1	0.17	1.02	490.0	1.43	1.7750	0.6518	1.1569	3.4771	2.2664	2.0536
67	52	42	107	45	0.39	20.27	107.2	2.65	0.7287	13.2551	9.6587	0.6698	8.8777	7.0380
123	80	46	34	24	0.89	71.04	-35.2	-1.33	-0.4345	9.3844	-4.0778	0.1189	1.1158	1.7719
127	45	29	29	39	1.15	51.96	-44.2	-1.70	-0.5831	8.4887	-4.9500	0.2435	2.0667	2.8865
129	7	6	9	13	1.15	8.08	-25.7	-0.42	-0.2976	2.0059	-0.5969	0.0432	0.0867	0.1776
134	18	26	28	17	0.61	10.93	138.0	1.99	0.8670	5.2590	4.5597	0.9153	4.8137	3.9533
135	65	64	107	84	0.74	48.27	32.6	1.22	0.2820	18.6471	5.2583	0.1382	2.5763	1.4828
140	33	62	87	93	1.03	34.01	82.3	2.27	0.6006	14.2849	8.5793	0.4765	6.8070	5.1527
141	64	45	14	2	0.13	8.23	447.1	2.16	1.6994	1.6223	2.7569	3.2009	5.1927	4.6850
145	45	29	46	37	0.79	35.41	-18.1	-0.61	-0.1996	9.4075	-1.8775	0.0121	0.1135	0.3747
147	31	20	40	33	0.70	21.58	-7.3	-0.20	-0.0761	7.2159	-0.5488	0.0002	0.0013	0.0417
153	91	48	85	78	0.91	82.37	-41.7	-2.25	-0.5400	17.3981	-9.3953	0.2028	3.5280	5.0737
157	61	25	101	38	0.35	21.24	17.7	0.53	0.1630	10.6910	1.7429	0.0639	0.6829	0.2841
162	157	90	192	179	0.90	141.51	-36.4	-2.63	-0.4526	33.8618	-15.3253	0.1317	4.4588	6.9359
167	31	29	18	10	0.95	29.55	-1.9	-0.04	-0.0189	4.4161	-0.0835	0.0050	0.0221	0.0016
168	37	23	28	24	0.52	19.42	18.5	0.44	0.1694	6.6955	1.1340	0.0671	0.4494	0.1921
173	19	16	27	10	0.38	7.27	120.0	1.57	0.7886	3.9389	3.1061	0.7714	3.0383	2.4493
174	95	87	214	183	0.96	91.05	-4.4	-0.25	-0.0454	30.0699	-1.3666	0.0020	0.0589	0.0621
181	74	38	94	70	1.15	85.12	-55.4	-3.14	-0.8065	15.1537	-12.2210	0.5137	7.7851	9.8559
188	87	47	115	63	0.46	39.63	18.6	0.70	0.1707	16.8715	2.8794	0.0678	1.1438	0.4914
201	126	101	191	141	1.04	130.50	-22.6	-1.45	-0.2563	32.2257	-8.2587	0.0277	0.8941	2.1165
203	66	21	18	15	1.02	67.24	-68.8	-2.69	-1.1637	5.3537	-6.2301	1.1534	6.1751	7.2499
208	77	51	26	7	0.21	16.05	217.9	2.49	1.1564	4.6369	5.3622	1.5528	7.2003	6.2009
212	21	18	15	4	0.39	8.11	121.8	1.23	0.7968	2.3756	1.8929	0.7859	1.8670	1.5083
214	52	29	6	10	2.07	107.87	-73.1	-2.28	-1.3136	3.0162	-3.9621	1.4980	4.5182	5.2048
215	45	30	62	44	0.91	41.12	-27.0	-1.02	-0.3153	10.4880	-3.3074	0.0509	0.5340	1.0430
216	70	59	153	118	0.75	52.34	12.7	0.55	0.1197	21.2886	2.5488	0.0439	0.9338	0.3052
348	60	23	97	92	0.85	51.12	-55.0	-2.75	-0.7987	11.8552	-9.4682	0.5026	5.9584	7.5618
380	29	25	63	27	0.46	13.40	86.5	1.74	0.6233	7.7744	4.8459	0.5084	3.9526	3.0206
516	24	33	33	11	0.28	6.69	393.1	3.61	1.5955	5.1156	8.1621	2.8401	14.5286	13.0229
578	48	37	103	57	0.65	31.23	18.5	0.61	0.1696	13.1045	2.2221	0.0672	0.8810	0.3768
698	30	18	51	15	0.45	13.53	33.0	0.67	0.2852	5.5976	1.5964	0.1406	0.7868	0.4553
703	46	14	100	66	0.69	31.71	-55.9	-2.35	-0.8176	8.2500	-6.7452	0.5298	4.3711	5.5149
704	6	7	54	43	0.78	4.70	49.0	0.67	0.3986	2.8246	1.1260	0.2385	0.6736	0.4488
709	7	5	6	1	0.16	1.12	348.3	1.22	1.5003	0.6587	0.9882	2.5280	1.6652	1.4825
710	51	11	71	26	0.45	23.15	-52.5	-1.81	-0.7442	5.9070	-4.3961	0.4284	2.5305	3.2717
795	151	121	73	40	0.65	97.90	23.6	0.90	0.2118	18.0896	3.8319	0.0909	1.6448	0.8117
836	6	7	36	25	0.73	4.39	59.3	0.75	0.4656	2.6252	1.2222	0.3083	0.8095	0.5690
838	29	8	69	70	0.65	18.83	57.5	-1.96	-0.8562	5.2224	-4.4715	0.5875	3.0683	3.8285
889	30	22	15	24	1.09	32.57	-32.5	-0.91	-0.3924	5.3271	-2.0903	0.0916	0.4880	0.8202
933	179	165	26	11	0.30	54.08	205.1	2.87	1.1154	6.6074	7.3699	1.4523	9.5958	8.2203
943	36	13	26	20	0.68	24.68	-47.3	-1.45	-0.6402	5.1584	-3.3024	0.3030	1.5632	2.1142
944	12	9	13	4	0.27	3.26	175.9	1.40	1.0148	1.9119	1.9401	1.2198	2.3322	1.9687
945	12	6	9	9	1.35	16.22	-63.0	-1.44	-0.9942	2.1124	-2.1001	0.8181	1.7281	2.0879
946	64	42	46	26	1.05	67.03	-37.3	-1.47	-0.4674	9.8464	-4.6023	0.1427	1.4046	2.1512
948	22	24	23	29	1.15	25.35	-5.3	-0.13	-0.0548	6.0364	-0.3310	0.0012	0.0073	0.0181
968	150	111	181	167	0.87	131.05	-15.3	-0.99	-0.1661	35.6456	-5.9196	0.0058	0.2078	0.9831
972	190	86	57	51	0.66	126.15	-31.8	-1.64	-0.3831	18.2260	-6.9826	0.0861	1.5690	2.6751
978	120	51	234	105	0.30	35.40	44.1	1.77	0.3650	23.3869	8.5372	0.2068	4.8364	3.1164
980	60	41	170	186	0.97	58.10	-29.4	-1.50	-0.3486	18.6176	-6.4895	0.0670	1.2475	2.2621
982	13	13	42	17	0.52	6.77	92.2	1.34	0.6532	4.1802	2.7304	0.5519	2.3070	1.7835
985	10	5	34	13	0.66	6.62	-24.4	-0.44	-0.2801	2.4478	-0.6857	0.0363	0.0887	0.1921
986	25	17	61	30	0.59	14.82	14.7	0.35	0.1376	6.6335	0.9125	0.0517	0.3427	0.1255
987	32	6	29	8	0.20	6.37	-5.8	-0.10	-0.0598	2.7651	-0.1653	0.0009	0.0025	0.0099
988	15	6	43	12	0.31	4.63	29.6	0.44	0.2594	2.9119	0.7553	0.1219	0.3549	0.1959
989	9	2	57	27	0.45	4.06	-50.7	-0.87	-0.7075	1.4965	-1.0587	0.3816	0.5711	0.7490
990	13	7	31	17	0.56	7.23	-3.2	-0.06	-0.0330	3.1827	-0.1051	0.0032	0.0102	0.0035
991	89	26	159	117	0.85	75.39	-65.5	-4.14	-1.0646	15.1357	-16.1140	0.9505	14.3861	17.1555
996	204	81	48	27	0.31	63.68	27.2	0.86	0.2406	12.7211	3.0613	0.1091	1.3883	0.7367
Total	3,564.0	2,315.0	4,101.0	2,913.0		2,550.56				618.4560	-55.4826		165.3265	170.3039

Lt = -0.0897
Ut = 0.9142
Et = -8.58 Apparent Change in Crashes in Percent
Lse = 0.0402
Z = -2.23
Lower Limit = -0.1685 = 0.8449 = -15.51 95% Lower Limit in Percent
Upper Limit = -0.0109 = 0.9892 = -1.08 95% Upper Limit in Percent

Source	X^2	df
Treatment	4.98	1
Homogeneity	165.33	62
Total	170.30	63

Odds Ratio = -8.55 Apparent Change in Crashes in Percent
Z = -2.48
Lower Limit = -14.79 95% Lower Limit in Percent
Upper Limit = -1.86 95% Upper Limit in Percent

Table 10. Summary of the effects of lowering posted speed limits.

Reference	Country	Speed Limit Change	Results
Nilsson (1990)	Sweden	110 km/h to 90 km/h (68 mi/h to 56 mi/h)	Speeds declined by 14 km/h Fatal crashes declined by 21%
Engel (1990)	Denmark	60 km/h to 50 km/h (37 mi/h to 31 mi/h)	Fatal crashes declined by 24% Injury crashes declined by 9%
Peltola (1991)	UK	100 km/h to 80 km/h (62 mi/h to 50 mi/h)	Speeds declined by 4 km/h Crashes declined by 14%
Sliogeris (1992)	Australia	110 km/h to 100 km/h (68 mi/h to 62 mi/h)	Injury crashes declined by 19%
Finch et al. (1994)	Switzerland	130 km/h to 120 km/h (81 mi/h to 75 mi/h)	Speeds declined by 5 km/h Fatal crashes declined by 12%
Scharping (1994)	Germany	60 km/h to 50 km/h (37 mi/h to 31 mi/h)	Crashes declined by 20%
Newstead and Mullan (1996)	Australia	5-20 km/h decreases (3-12 mi/h decreases)	No significant change (4% increase relative to sites not changed)
Parker (1997)	USA 22 states	5-20 mi/h decreases (8-32 km/h decreases)	No significant changes

Source: Table 3, J. Stuster and Z. Coffman, *Synthesis of Safety Research Related to Speed and Speed Management*, FHWA-RD-98-154, July 1998.

Table 11. Summary of the effects of raising posted speed limits.

Reference	Country	Speed Limit Change	Results
NHTSA (1989)	USA	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Fatal crashes increased by 21%
McKnight, Kleinand, and Tippetts (1990)	USA	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Fatal crashes increased by 22% Speeding increased by 48%
Garber and Graham (1990)	USA (40 States)	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Fatalities increased by 15% Decrease or no effect in 12 States
Streff and Schultz (1991)	USA (Michigan)	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Fatal and injury crashes increased significantly on rural freeways
Pant, Adhami, and Niehaus (1992)	USA (Ohio)	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Injury and property damage crashes increased but not fatal crashes
Sliogeris (1992)	Australia	100 km/h to 110 km/h (62 mi/h to 68 mi/h)	Injury crashes increased by 25%
Lave and Elias (1994)	USA (40 states)	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Statewide fatality rates decreased 3-5% (Significant in 14 of 40 States)
Iowa Safety Task Force (1996)	USA (Iowa)	55 mi/h to 65 mi/h (89 km/h to 105 km/h)	Fatal crashes increased by 36%
Parker (1992)	USA (Michigan)	Various	No significant changes
Newstead and Mullan (1996)	Australia (Victoria)	5-20 km/h increases (3-12 mi/h increases)	Crashes increased overall by 8% 35% decline in zones raised from 60-80 km/h
Parker (1997)	USA 22 states	5-15 mi/h (8-24 km/h)	No significant changes

Source: Table 3, J. Stuster and Z. Coffman, *Synthesis of Safety Research Related to Speed and Speed Management*, FHWA-RD-98-154, July 1998.

FUTURE SPEED LIMIT ENHANCEMENTS

Future improvements in setting speed limits and aiding the driver in selecting a safe and reasonable speed for conditions include development of an expert knowledge-based speed limit

setting procedure, utilizing variable speed limit systems in selected areas, and adopting emerging road and vehicle technologies. An overview of possible future improvements is given in the following paragraphs.

Expert Knowledge-Based Speed Limit Setting System

Implementation of the current speed limit setting procedure in the Province requires considerable experience and subjective consideration of a number of factors including crash experience, roadside development, pedestrian activity, etc. The subjective process can lead to non-uniform limits for similar road and traffic conditions because engineers typically have different experiences and make decisions based on their experience.

An expert knowledge-based speed limit system, similar to the one used for over 15 years in Australia, is currently being developed for implementation in the United States and is expected to be available for general use by the year 2005. The primary benefit of an expert system is that it combines the experiences of many experts and assists the non-expert in making a speed limit decision. A similar system may be appropriate sometime in the future for British Columbia.

Variable Speed Limit Systems

The current practice of posting the maximum speed limit on a fixed-sign is a cost-effective solution for informing motorists of a safe and reasonable speed limit for ideal conditions. When conditions such as weather, traffic volumes, etc. are less than ideal, each motorist must chose the appropriate speed for conditions. The only guidance the driver has in these situations is his or her experience.

For over 20 years in some European countries, variable speed limit systems have been used to monitor environmental and traffic conditions and display maximum speed limits based on changing conditions. Application of variable speed limit systems also has been undertaken in the United States on a limited basis due to the high cost which limits the area that can be covered with these systems. The systems in Europe seem especially effective in areas where visibility conditions vary widely from one kilometer to the next. As the technology continues to improve, and the system costs decrease, the effectiveness of these systems for widespread application in other countries will be demonstrated. In the future, these systems may be applicable the wide range of environmental conditions found in British Columbia. They especially have application in fog-prone areas and for other conditions where driver visibility and the coefficient of friction on the road is reduced due environmental conditions. When expensive systems like these are being considered for a specific use, it is desirable to conduct a benefit-cost analysis to determine if they are economically beneficial.

Intelligent Transportation System Technologies

Finally, the emerging Intelligent Transportation System (ITS) technologies provide a wide range of potential future applications to inform the driver, automate the speed decision-making process, and reduce crashes. Features such as driver guidance information systems, crash avoidance systems, advance speed governors, etc. have broad application in the future management of vehicle speeds.

ACTION PLAN FOR IMPLEMENTATION OF FINDINGS

Legislation

As part of a continuing comprehensive speed management program, consideration should be given to enacting and promoting a basic speed law in the Province.

In addition, encouraging the use of four-way flashers on slow moving vehicles to provide warning to other drivers should be included in the legislative program, if necessary.

MoT Policy Revisions

Consideration should be given to establishing a 120 km/h maximum limits on multilane limited access highways constructed to high design standards.

A maximum speed limit of 110 km/h should be considered for freeways which are limited access facilities except for right-in and right-out intersections.

The practice of using transition speed zone limits when entering or leaving an urban or built-up area should be re-examined. Speed limits in these areas should be set based on road conditions, access points, etc. This procedure would also promote consistent speed limit applications in the Province.

Special speed limit reductions for signalized at-grade intersections located on high-speed freeways is appropriate. A maximum speed limit of 90 km/h is appropriate for these special conditions.

Revision of Posted Speed Limits on Selected Road Segments

Field studies and revision of speed limits for candidate multilane and two-lane road segments should be conducted at time and personnel resources permit to provide appropriate and consistent speed limit in the Province.

Advisory night limits for wildlife hazards should be posted on a trial basis on selected Provencal roads to determine their effectiveness.

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APPENDIX A – SELECTED SPEED REFERENCES FROM THE BRITISH COLUMBIA MOTOR VEHICLE ACT

Motor Vehicle Act – 'Speed' references in the legislation.

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MOTOR VEHICLE ACT

[RSBC 1996] CHAPTER 318

[Updated to November 5, 2001]

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Liability of owner for speeding and traffic light violations

83.1 (1) In this section:
"owner" includes
(a) a person in possession of a motor vehicle under a contract by which the person may become the owner on full compliance with the contract, and in whose name alone the motor vehicle is registered under this Act,
(b) a person who rents or leases a motor vehicle from another person, and
(c) a person who holds a licence under section 38, 41, 42 or 44;
"speed monitoring device" means a speed monitoring device prescribed under subsection (8) that is capable of photographing or capturing the image of a motor vehicle while accurately and simultaneously measuring and recording its speed;
"traffic control signal" has the same meaning as in section 119;

Erection of speed sign

139 On a highway where new construction, reconstruction, widening, repair, marking or other work is being carried out, traffic control devices must be erected to limit the rate of speed of vehicles or to restrict the manner in which the vehicles are to proceed on the highway.

Obedience to speed signs

140 Where traffic control devices as indicated in section 138 or 139 are erected or placed on the highway, a person must not drive or operate a vehicle at a greater rate of speed than, or in a manner different from, that indicated on the signs.

Obeying flagger

141 If a flagger is controlling the movements of traffic around the section of highway being worked on, a person must not drive or operate a vehicle other than as directed by the flagger.

Careless driving prohibited

144 (1) A person must not drive a motor vehicle on a highway
(a) without due care and attention,
(b) without reasonable consideration for other persons using the highway, or
(c) at a speed that is excessive relative to the road, traffic, visibility or weather conditions.
(2) A person who contravenes subsection (1) (a) or (b) is liable on conviction to a fine of not less than $100 and, subject to this minimum fine, section 4 of the *Offence Act* applies.

Slow driving

145 (1) A person must not drive a motor vehicle at so slow a speed as to impede or block the normal and reasonable movement of traffic, except when reduced speed is necessary for safe operation or in compliance with law.

(2) If the driver of a motor vehicle is driving at so slow a speed as to impede or block the normal and reasonable movement of traffic, a peace officer may require the driver to increase his or her speed, or to remove the motor vehicle from the roadway to the nearest suitable place and to refrain from causing or allowing the motor vehicle to move from that place until directed to do so by a peace officer.

Speed limits

146 (1) Subject to this section, a person must not drive or operate a motor vehicle on a highway in a municipality at a greater rate of speed than 50 km/h, and a person must not drive or operate a motor vehicle on a highway outside a municipality at a greater rate of speed than 80 km/h.
(2) The Minister of Transportation and Highways may, by causing a sign to be erected or placed on a highway limiting the rate of speed of motor vehicles or a category of motor vehicles driven or operated on that portion of the highway, increase or decrease the rate of speed at which a person may drive or operate a motor vehicle or a category of motor vehicle on that portion of the highway.

(3) If the Minister of Transportation and Highways has caused a sign to be erected or placed on a highway limiting the rate of speed of motor vehicles or a category of motor vehicles driven or operated on that portion of the highway, a person must not, when the sign is in place on the highway, drive or operate a vehicle on that portion of the highway at a greater rate of speed than that indicated on the sign for that category of motor vehicle.
(4) The Minister of Transportation and Highways may, by notice in the Gazette, define areas in the unorganized area of British Columbia, and may by causing signs to be erected at the entrance to an area so defined direct the rate of speed at which a person may drive or operate a motor vehicle or a category of motor vehicle in that area, but the rate of speed must not be greater than 60 km/h.
(5) If the Minister of Transportation and Highways has caused signs to be erected or placed on a highway in accordance with subsection (4), a person must not, when the sign is in place on the highway, drive or operate a vehicle on a highway at a greater rate of speed than that indicated on the sign for that category of motor vehicle, unless another sign on a specific highway in the defined area so indicates.
(6) Subject to subsections (2) and (3), a municipality may by bylaw direct the rate of speed at which a person may drive or operate a motor vehicle on a highway in the municipality.
(7) If, under a bylaw adopted by a municipality, signs have been erected or placed on a highway limiting the rate of speed of motor vehicles driven or operated on a designated portion of the highway, a person must not, when the sign is in place on the highway, drive or operate a motor vehicle on that portion of the highway at a greater rate of speed than that indicated on the sign.
(8) A municipality may by bylaw direct that the rate of speed at which a person may drive or operate a motor vehicle in the municipality on a lane not exceeding 8 m in width must not be in excess of 20 km/h.
(9) Despite section 267 of the *Local Government Act*, a person who contravenes a bylaw made under subsection (6) or (8) does not commit an offence against the bylaw.
(10) A municipality that has enacted a bylaw under subsection (8) is not required to erect signs designating the rate of speed at which motor vehicles may be driven or operated.
(11) A person must not drive or operate a motor vehicle on a lane in a municipality that has enacted a bylaw under subsection (8) at a greater rate of speed than 20 km/h.

Schools and playgrounds

147 (1) Every person driving, between the hours of 8 a.m. and 5 p.m. on a day school is regularly held, a vehicle on a highway where signs are displayed stating a speed limit of 30 km/h or on which the numerals "30" are prominently shown, must drive at a rate of speed not exceeding 30 km/h while approaching, passing or in the vicinity, as indicated by the signs, of the school to which the signs relate.
(2) A person driving a vehicle on a highway must drive the vehicle at a rate of speed not exceeding 30 km/h when approaching or passing, between dawn and dusk, a public playground for children where signs are displayed stating a speed limit of 30 km/h, or on which the numerals "30" are prominently shown.

Excessive speeding

148 (1) A person who drives a motor vehicle on a highway at a speed greater than 40 km/h over the applicable speed limit set under the authority of an enactment commits an offence and is liable on conviction to not less than the aggregate of the fine amount and the applicable supplemental fine amount, if any, prescribed under section 148.1 for this offence and, subject to those amounts, section 4 of the *Offence Act* applies.
(2) If a person is charged with an offence under subsection (1) and the evidence does not prove the offence but does prove a contravention of section 140, 146 or 147, the person may be convicted of contravening section 140, 146 or 147, as the case may be, and the person is liable on that conviction to not less than the aggregate of the fine amount and the applicable supplemental fine amount, if any, prescribed under section 148.1 for that offence.

Fines for speeding offences

148.1 (1) In relation to a contravention of section 140, 146 (1), (3), (5) or (7), 147 or 148 (1), the Lieutenant Governor in Council may prescribe
(a) a fine amount, and
(b) a supplemental fine amount.
(2) Without limiting subsection (1), the Lieutenant Governor in Council may prescribe
(a) different fine amounts for the different contraventions referred to in subsection (1), and
(b) supplemental fine amounts that vary in relation to the degree by which a person, in committing the offence, exceeds, by a prescribed rate of speed, the applicable speed limit established under section 140, 146 (1), (3), (5) or (7), 147 or 148 (1), as the case may be.

(3) A person who contravenes section 140, 146 (1), (3), (5) or (7), 147 or 148 (1) is liable on conviction to a minimum fine of not less than the aggregate of
(a) the fine amount prescribed in relation to the contravention, and
(b) the supplemental fine amount, if any, prescribed in relation to, and applicable to the degree of, the contravention.
(4) If, by means of a violation ticket defined in section 1 of the *Offence Act*, a person is charged with an offence under section 140, 146 (1), (3), (5) or (7), 147 or 148 (1) of this Act and the evidence proves the offence but to a different degree than that reflected by the supplemental fine amount included in the ticketed amount, as that term is defined in section 1 of the *Offence Act,*
(a) the person may be convicted of the offence, and
(b) the supplemental fine amount may be varied in accordance with the amount prescribed under subsection (2) (b) to reflect the degree by which the person exceeded the applicable speed limit.
(5) The owner of a motor vehicle who is liable under section 83.1 (2) for a contravention referred to in subsection (1) of this section is liable on conviction to a minimum fine of not less than the aggregate of
(a) the fine amount prescribed in relation to the contravention, and
(b) the supplemental fine amount, if any, prescribed in relation to, and applicable to the degree of, the contravention.
(6) If a violation ticket, defined in section 1 of the *Offence Act,* is issued to an owner of a motor vehicle in respect of an offence under section 83.1 (2) of this Act and the evidence proves the contravention of section 140, 146 (1), (3), (5) or (7), 147 or 148 (1), as the case may be, but to a different degree than that reflected by the supplemental fine amount included in the ticketed amount, as that term is defined in section 1 of the *Offence Act,*
(a) the owner may be convicted, and
(b) the supplemental fine amount may be varied in accordance with the amount prescribed under subsection (2) (b) to reflect the degree by which the applicable speed limit was exceeded.

Technical Circular T-10/00
File: 195-20/TECH
Date: April 14, 2000

To: All HQ Directors: Operations, Planning & Major Projects
All Regional Directors
All District Highways Managers

SUBJECT: CORRIDOR SPEED LIMIT PROCEDURE AND SPEED LIMIT APPROVALS

!CANCELS AND REPLACES T-13/99!

PURPOSE:
To confirm Ministry procedure for establishing speed limits on the provincial highway system.

PROCEDURE:

1. **Legislative Authority**

   Under Section 146(1) of the Motor Vehicle Act, the speed limit on a highway within a municipality is 50 km/h and outside of a municipality is 80 km/h unless otherwise posted.

   By erecting a sign along the highway under the authority of the Minister, the speed limit may be increased or decreased within the "speed zones" or the terminals at which the sign is erected.

2. **Assessing Speed Limits**

   Speed limits on the provincial highway system shall be assessed in general accordance to the ITE document, entitled ***"Speed Zone Guidelines - A Proposed Recommended Practice"***, published by the Institute of Transportation Engineers, # 410 525 School Street SW, Washington DC, USA 20024-2797. The assessment should be based on an engineering evaluation including, but not limited to, the following factors:

   - 85^{th} percentile speed,
   - speed accident history,
   - geometric features,
   - land use.

   A speed zone is a length of roadway with the same speed limit between terminal points.

   Additionally, the following specific guidelines should be used when establishing speed limits:

   - Speed zones on highway corridors should generally be a minimum of 10km long;

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- Minimum speed limits on numbered highways: 50km /h
- Maximum speed limit: 110 km/h.
- Speed limit changes should be limited to 20 km/h intervals (desirable), or 30km/h (acceptable). If changes of greater than 30 km/h are necessary, a transition zone should be added. The transition zone length should be:

TRANSITION ZONE SPEED LIMIT	TRANSITION ZONE MINIMUM LENGTH
50 – 80 km/h	480m
>80 km	800m

- 30 km/h school or playground speed limits are not to be used on numbered highways. School and playground speed limits are specific to their surrounding area. They are assessed by Region/District staff and do not require an H0223 form or HQ approval.

3. Speed Limit Approval

Speed limits are documented on the H.223 form. The speed limit must be approved by the Headquarters Senior Traffic and Electrical Engineer.

4. Speed Limit Administration:

- Regional Traffic Engineers (RTE) are required to submit completed H.223 forms to Traffic and Electrical Engineering Section in HQ, with analysis and rationale attached.
- Speed zone numbers will be assigned by Traffic and Electrical Engineering.
- Upon approval of the speed zone, Traffic and Electrical Engineering staff will distribute copies of the H.223 as follows:

  - Original to the District Highways Manager (DHM)
  - Copy to Regional Traffic Engineer
  - Copy retained at Headquarters

- District Highways Managers are required to sign the H.223, indicating the date the regulatory signs were installed, then distribute the H.223, as indicated at the bottom of the form. This distribution includes a copy to the:

  - Office of the Senior Traffic Engineer
  - Regional Traffic Engineer
  - OiC Integrated Traffic Camera Unit (ITCU), Richmond, BC
  - NCO i/c Regional ITCU
  - District Files
  - Centreline Marking Supervisor (forward only if No Passing Zones required changing).

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- Sign placement in the field may vary by +/- 50m from dimensions specified on the H.223 form.

- The RTE is responsible for maintaining a current speed zone database.

- The signed original H0223 form is returned to HQ.

CONTACT:

Glen Roberts, Senior Traffic Standards Technologist
Traffic/Electrical Engineering Section
Engineering Branch
Phone: (250) 387–7675

Original Approved by...

M.F. Clark, P.Eng.
Chief Engineer
Engineering Branch

Attachment:
Speed Zone Guidelines
A Proposed Recommended Practice

This document can be obtained from:
http://www.ite.org

or by contacting:

Institute of Transportation Engineers
525 School St., S.W., Suite 410
Washington, D.C. 20024-2797

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